FEBRUARY 3, 1938 FIRST AERO WEEKLY IN THE WORLD REGD. AT THE G.P.O. AS A NEWSPAPER

FEB 14 1938

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FLIGHT

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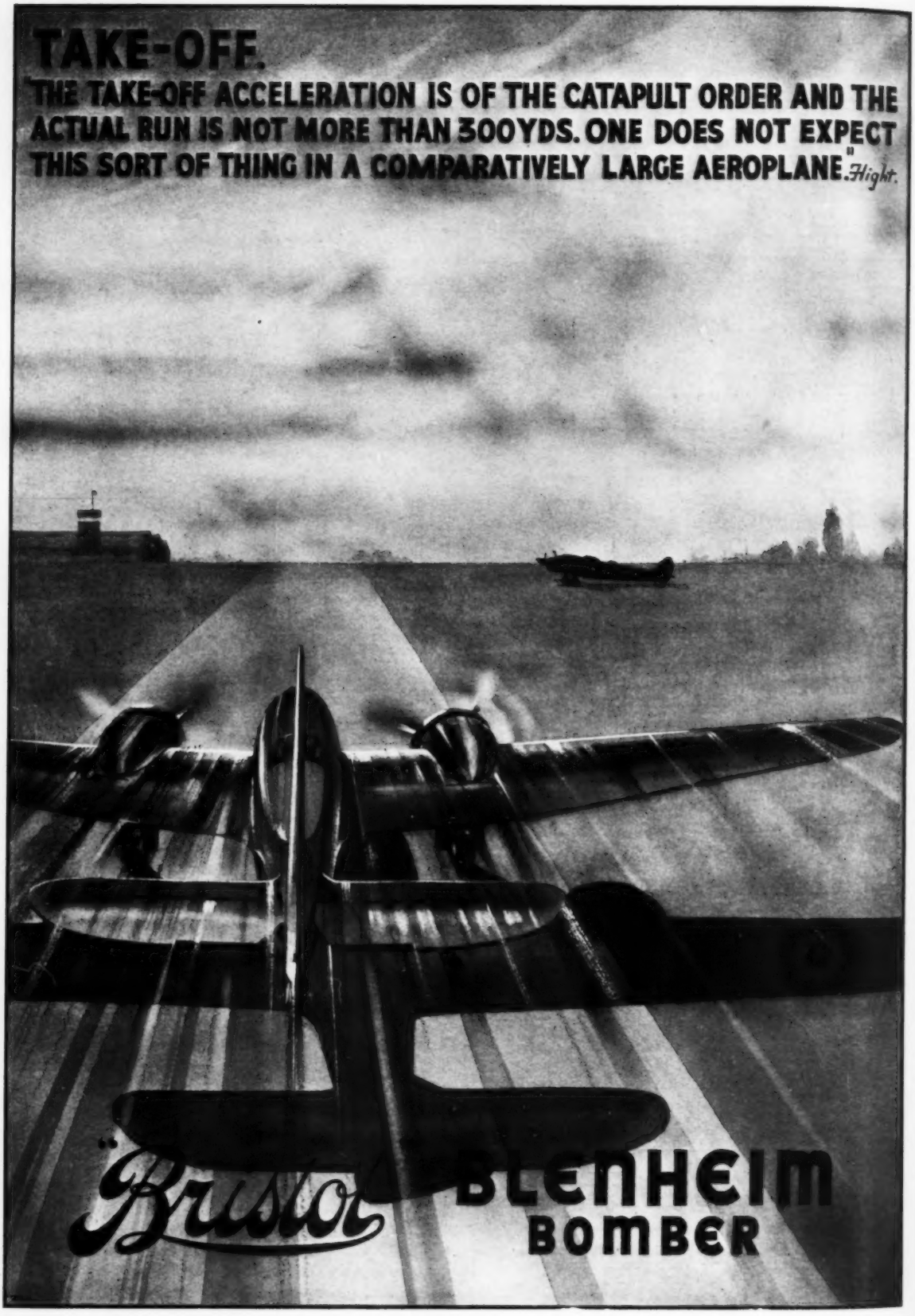
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FLIGHT

The AIRCRAFT ENGINEER AND AIRSHIPS

FIRST AERONAUTICAL WEEKLY IN THE WORLD : FOUNDED 1909

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The Outlook

Post-conferential

NOW that the representatives of the Airports Conference have had their say and while the Cadman Committee is still in secret conclave, it might be as well to attempt to clarify the general position in the field of useful subsidies.

Not unnaturally the aerodrome representatives were almost universally in favour of a direct airport subsidy. In some ways such a subsidy might be considered a good and fair one, though on principle we are opposed to it. In any case, it is extremely unlikely, to say the least of it, that the Government will consider such a provision following the Maybury Committee's recommendations to the contrary.

The Government might, however, consider very seriously the possibility of a complete change of front in the matter of air transport subsidies, and these would, while indirectly benefiting the aerodrome owners in a way which would at least be economically healthy, help the entire flying industry.

Basically, *Flight* is firm in its belief that air transport must eventually, in Mr. Winston Churchill's words, fly by itself. But since these words were spoken the entire appearance of world transport has been changed, and everywhere Governments are subsidising their selected air transport companies very heavily so that these companies may not only help to uphold the particular country's prestige and indirectly assist its commercial interests, but also so that the aircraft manufacturing industry may be assisted and machines be produced which will find favour in the world's markets.

Not Too Late

IT is possible that the present craving for speed and uneconomic efficiency will disappear in course of time, and no one can deny that the type of machine which has been produced in this country during the past few years has proved itself more capable of making a profit in normal operating conditions than any others in the world. Such has been the direct result of self-sufficiency.

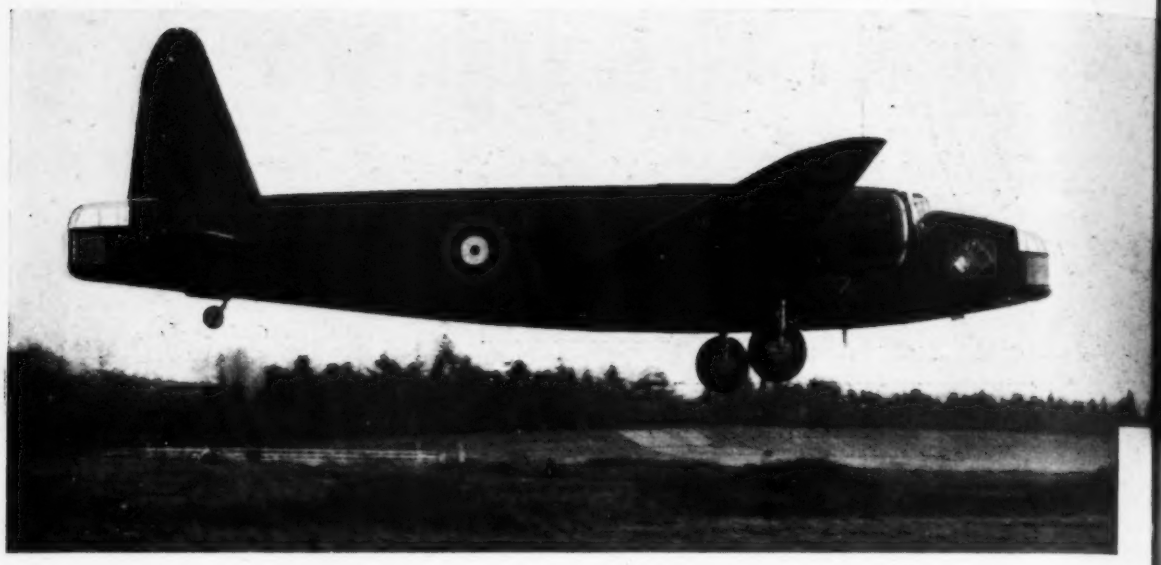
During its last year of operation, for instance, and by virtue of hard work, much joy-riding and the use of suitable machines, Hillman's Airways were reputed to have made quite a reasonable little profit. This without the help of any subsidy whatever, and, if we may say so, with the hands of many people (who should have known better) against them largely because of the late Mr. Hillman's forthright and common-sense methods. He was not, so to speak, playing at air transport; he intended that it should be made to produce a profit.

While we have been trying so hard to fly by ourselves, however, the rest of the world has been flying much faster, if not more efficiently, with the help of large subsidies. Nor is there anything new and unreasonable about the idea of such subsidies for industries from which the returns, though not immediately obvious, are of definite benefit to the entire community. As an instance—and this brings up an entirely new subject when considered in terms of the often criticised payments made to Imperial Airways—the P. and O. Company have been heavily subsidised from the very start in order that India, Australia and ourselves should receive the obviously necessary benefits which always accrue from fast and regular transport services.

It is not too late to consider an important change of front in this matter. Whatever their direct usefulness or otherwise, a series of really fast and logical services in this country alone might provide the manufacturers with the necessary stimulus to produce the kind of machines which are at present in demand overseas. Such services could only be run with financial assistance, and this assistance might reasonably be extended to a number of others, in Europe and even farther afield, with the same object in view.

Obviously, no private manufacturer can afford to lay down the necessary plant for the manufacture of a machine which may only be sold in very small quantities. The risk is far too great. If, however, these manufacturers could feel certain that a useful number of machines could be sold, there would be no difficulty in finding the necessary money for development. Furthermore, assistance might, in the end, prove to be an economy, since it would enable manufacturers to keep abreast of technical progress and so save money in the development of military prototypes.

The entire situation has certain resemblances to that of armament and disarmament. While the rest of the world arms its air transport with adequate subsidies, we can hardly afford to fail to follow suit.



Tricyclery

THE British aircraft world has taken the tricycle undercarriage (incidentally, *can* anybody suggest a less unwieldly term?) to its heart. At the resumed discussion, last Thursday, the Royal Aeronautical Society put the seal of approval, unofficially at any rate, on the scheme.

The vice-president of the Society, Mr. F. Handley Page, who was in the chair, refrained from committing either himself or the Society, but the members of the audience who took part in the discussion (reported on pages 103 and 104) were obviously quite overwhelmingly in favour of the tricycle.

A cynic once remarked that what the rest of the world, particularly America, thought three years ago, the R.Ae.S. thinks to-day. That was, perhaps, rather unkind, but there is no getting away from the fact that it must be quite three years ago that Mr. Weick introduced his two-control aeroplane, of which the tricycle undercarriage was an essential feature. So it has taken that long for the idea to be accepted in this country. Well, caution is sometimes a good thing, and it still remains to be seen whether or not the tricycle has some fundamental drawback when applied to really large aeroplanes. Sufficient experience is already available to show that for small ones the advantages far outweigh the disadvantages.

Almost everything will depend upon the way in which the tricycle is used. Accepting as typical of the majority of designers the views expressed during the discussion, there is too great a tendency to regard the tricycle undercarriage as yet another excuse for increasing the wing loading so as to get a little extra cruising speed. Several weeks ago *Flight* ventured to plead for a halt in the craze for performance, at any rate until the lower end of the speed scale has received a little more attention.

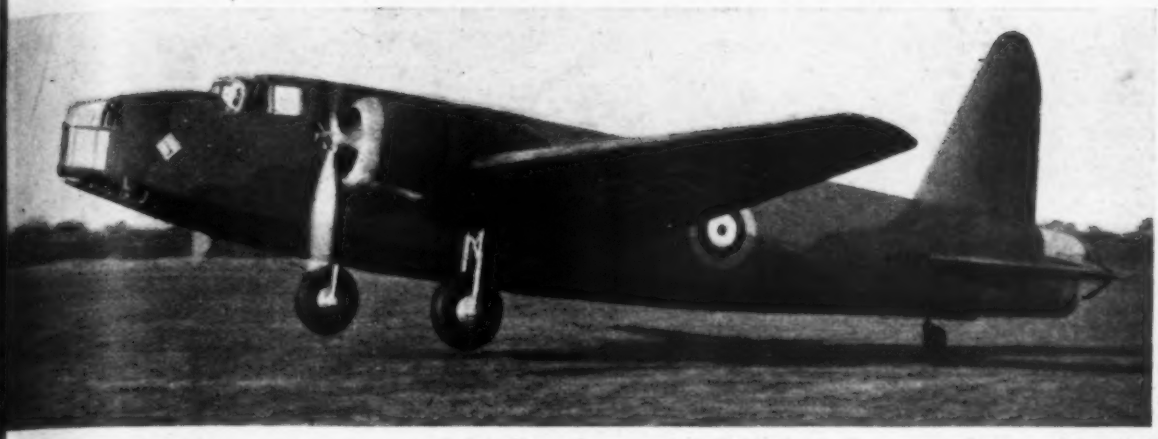
With the possible exception of the long-distance air routes, commercial aviation on a large scale will never be worthy of the name while exceptional skill and experience are required of the pilots. When taking-off and landing are no more pregnant with possibilities than is berthing a motor launch, the use of air travel may be expected to increase. At present the landing of an aeroplane is rather like berthing a launch without being able to use the propeller in reverse, and takes place at the speed of an express train at that.

Plea for Sanity

FOR sane and sound development it would be better not to expect from the tricycle undercarriage yet another step in performance, but to use it rather for contributing to the pilot's peace of mind by relieving him of the necessity to judge his landing with 100 per cent. perfection. The modern generation of pilots, brought up as it is on ultra-reliable engines, thinks of the weather conditions at the other end and wonders whether they are such as to make landing difficult. It is safe to say that it never bothers its head about engine failure. We believe we are right in saying that there are short-service pilots in the R.A.F. to-day who have completed their period

THE WELLINGTON: THREE NEW IMPRESSIONS

"This desirable Tudor residence" is suggested by the geodetic window-panes of the Vickers Wellington I medium bomber (two Bristol Pegasus with two-speed superchargers), but the performance is anything but medieval. This, the production job—photographed by *Flight* at Brooklands last week—has been very considerably cleaned-up as compared with the prototype which, it may be remembered, had an oddly insect-like bulge at the tip of the tail. The unfamiliar fittings within the collector rings are Vickers crankcase cowlings.



without their squadron having had a single forced landing due to engine failure.

Thus the preoccupation of the modern pilot is with weather conditions *en route* and the visibility at the destination. Direction-finding will help to solve the former difficulties, but the final stage—the approach and actual landing—is still the great obstacle. Unless and until that is overcome, it would be unwise to ask even more of the pilot than we are asking already.

The tricycle undercarriage can contribute a fair share of the solution if we rest content with the present, or even slightly lower, landing speeds.

Effect on Design—

ACCEPTING the tricycle undercarriage principle as desirable, it is of interest to examine the effect which it is likely to have on design. In the small-aeroplane class, it may well be that the type which has the single wheel at the back will achieve considerable popularity. It calls for no very drastic alteration in design, as it can be used conveniently in conjunction with the engine in the nose, whereas the front wheel presents considerable problems. In single-engined service aircraft, also, this type of tricycle may offer a more convenient solution, not only for deck-landing machines, but for single-engined bombers, which may have to operate from advanced bases of restricted dimensions.

In commercial aircraft it seems likely that the tricycle undercarriage may quite well cause a breakaway from the ubiquitous low-wing monoplane type which is so popular at the moment. By using the high-wing arrangement the airscrews are raised well clear of the ground when the bottom of the fuselage is within single-step height, and the length of retractable front leg is greatly reduced.

Tricycles, too, may well affect the almost-foolproof light aeroplane. Here a pusher airscrew arrangement has much to recommend it. That its performance may be slightly inferior is of no great importance.

One very great advantage possessed by the tricycle undercarriage does not appear to be generally appreciated. In the orthodox aeroplane it is almost impossible to provide an undercarriage with very long stroke. The resulting ground angle becomes excessive, and it would be necessary to arrange a sort of two-position undercarriage, with the legs in an intermediate position for the take-off and fully down for landing. With the tricycle undercarriage that difficulty does not exist, as all three legs can be given a long stroke and the machine remain horizontal. Thus very good shock-absorbing qualities can be achieved.

—and Technique

CURIOUSLY enough, many of those who took part in the discussion at the R.Ae.S. seemed to think that the tricycle will demand a new landing technique. That is surely looking at it from the wrong end. There is no particular reason why the approach should not be made in the ordinary way, gradually losing speed until the moment the wheels touch. In fact, the logical way to use the tricycle undercarriage is to make almost a "three-point" touch-down, only the tail wheel will not be on the ground at the normal landing attitude. The difference does not come in until the two main wheels have touched; then it comes in very markedly. Instead of ballooning off again if the contact has been made at rather too high a speed, the tricycled machine will tilt forward on to its nose wheel and "spill" the lift. There will be no need for hangers-on at the wing-tips in a gusty wind, and the brakes can be safely applied as hard as the ground friction permits.

When landing in thick weather, or when a machine is being landed by a not-very-skilled pilot, the glide landing may be used with little fear of serious damage, but there is no reason to regard the glide landing as the normal landing of the tricycle undercarriage.

The take-off will differ but little from that of the present type. The machine will be much easier to keep straight, and plenty of speed will be needed before the machine is taken into the air. Thus the unpleasant and often dangerous results of taking off almost at the stalling speed and angle will automatically be avoided.

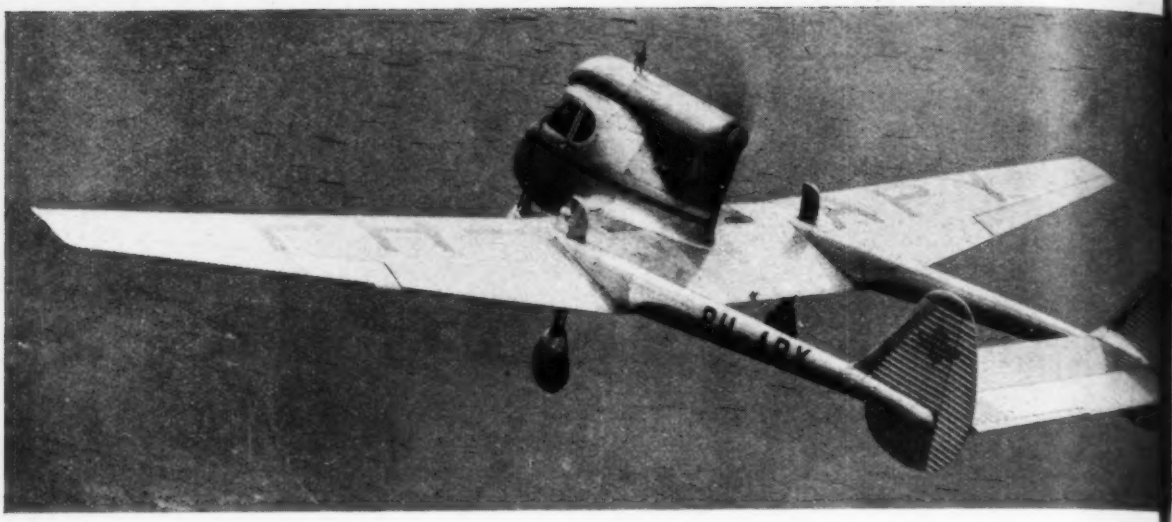
There are many who hold the view that the take-off run with the tail well up must be longer. The actual distance from standing start to disappearance of wheel marks may be longer, but it does not by any means follow that the distance to clear a given obstacle will be longer. On the contrary, it may be shorter. Those who witnessed the two-seater light plane trials at Lympne some years ago may remember the tests of taking off over a tape. Most of the pilots yanked their machines into the air as soon as possible, and many wallowed along, sinking into the tape as they crossed the line. Flt. Lt. Bulman, on the Hawker Cygnet, kept his tail up until he was near the line. He then did an almost vertical climb "up the poles," and cleared the tape.

Fleet Air Arm Machines

IT is very reasonable, and in fact commendable, that the Admiralty should appoint two Directors to deal with the Fleet Air Arm, now gradually passing under its direct control. One Director will deal with personnel, which in the past has been somewhat of a problem. Naval officers have lately shown a reluctance to offer themselves as pilots, and it has been stated that the reason was the dual command of Air Ministry and Admiralty.

It is also a natural step that an Admiralty Director should deal with the Fleet's requirements in aircraft. The suitability of certain R.A.F. types for use on carriers and on catapults has at times been questioned, and possibly the Admiralty may demand that some types be designed *ab initio* for Fleet requirements. It is, however, satisfactory to learn that there is no truth in the statement that Capt. Boucher will place orders direct with the manufacturers. No change has been made in the arrangement by which all aircraft orders are placed through the Air Ministry, and it is much to be hoped that none will be made.

DIARY OF FORTHCOMING EVENTS—Page 119.



SIMPLICITY fr

Flying Impression of the Stearman-Hammond Pusher : Tricycle Training for K.L.M. Pilots. By "Indicator"

AS one of the first machines to be designed and built round the tricycle principle, and certainly the first to be seen in Europe, the Stearman-Hammond Y can hardly be laughed aside as a mere experiment of no particular consequence. The example bought by K.L.M. was demonstrated at Croydon late last year and was described in *Flight* of November 18. Unfortunately, on that particular day, Customs' arrangements then prevented any interested person, however obviously a non-buyer, from riding in the machine (and certainly from flying it), but K.L.M. and the Netherlands authorities generally, rather less entangled in red tape, recently provided me with the necessary facilities at Schiphol aerodrome, Amsterdam. Which, in view of the fact that neither is actively interested in the sale of the machine, was particularly altruistic of them and in keeping with a co-operative spirit which is not, unfortunately, by any means universal even in the flying world.

At Schiphol the Hammond was entirely in its element, since the full effect of a good tricycle arrangement can best be appreciated on asphalt runways. The work of flying the machine consisted simply of (a) taking-off by driving it along the runway until a certain pre-determined speed was showing on the A.S.I., pulling it firmly off and trimming in due course to level flight ; and (b) landing by gliding it straight in on to the end of the chosen asphalt strip and applying the brakes just as vigorously as one felt inclined. During this crash stop process (carried out by a K.L.M. pilot by way of demonstration and leaving two black lines on the white surface of the runway) there was little or no tendency for the machine to swing off the straight course.

Probably the non-pilot, sitting in the machine for the first time, would, with a little verbal assistance, put up as good a show as anybody else. There is the Hammond's slight weakness, because the majority of the people who

If the position of undercarriage legs in this ground view of the Hammond is compared with that in the flying pictures above, the amount of movement will be appreciated ; the tricycle type of undercarriage permits an almost unlimited travel since the ground angle need not be considered. Ease of entry into the cabin is an obviously good feature of a machine on pusher-tricycle lines.

Two flying views of the Hammond taken during the machine's short visit to this country last year. The one-piece flap extends between the tail booms, which must, incidentally, have given the designers food for thought while working on the layout of the elevator controls. The rudders are fixed.

fm the STATES

are interested in it are those who have already learnt to fly and certain things must immediately be unlearnt. However, after five minutes or so my feet forgot to clamour for the non-existent rudder control, and a natural instinct to hold off in the conventional manner had already to some extent been overcome in previous tricycle experimentations.

By way of learning exactly what might happen, I did my best, on the first landing, to pull off a full three-pointer. The Hammond managed a half-hearted wheeler and remained poised with the tail in an intermediate position for perhaps two seconds; then the outfit sank gently forward on to its nose-wheel. For the benefit of those to whom the Hammond control arrangements are unfamiliar, it should be explained that there is no rudder control, turns being made on the ailerons alone, and my interest in the conventional landing was largely that of discovering whether, during the short time in which no directional control was available, the machine would swing momentarily one way or the other. It carried on in a rigidly straight line during those two interesting seconds.

Steering Car-fashion

The take-off run is normally made with the control columns more or less in the neutral position, and the steering is done, car-fashion, with the aileron control, which is connected to the front wheel. One's natural tendency, I should imagine, is to over-steer, though I suffered no trouble from this cause. With commendable caution I waited for something to happen before making any wheel movements. Left to itself and with the trimming crank moved so that the little indicator is approximately in its neutral position, the machine simply runs along in a straight line with little or no tendency to buck.

For better or for worse, the Hammond will not take itself off even when trimmed right back. Having accelerated until the A.S.I. shows about 90 km/hr. (55 m.p.h.) the wheel is hauled firmly back almost to its full extent, and as soon as the machine has left the ground it is eased forward momentarily whilst more speed is gathered. The flap lever is not used, nor is the flap pedal, which applies an additional 20 degrees to anything already set (or not set) by the main lever; apparently what little improvement can be obtained in take-off distance is nullified by the additional drag.

It might be asked how, if the ailerons are used for turning purposes, bumps may be corrected without a good deal of unnecessary yawing. The effect of the aileron control, however, depends entirely upon the way in which it is used. A gradual, firm and comparatively slow motion immediately produces an accurate turn in either direction, while a sharp tug lifts a wing without any appreciable deviation from the straight path. In changing from a steep turn in one direction to a similar turn in the other direction, there need be no perceptible skid if a little care is used, and deliberately careless handling does not produce any seriously untoward motions. By means of a weaving motion of the aileron control it is just possible to produce a rather feeble skidding sideslip which might be useful for losing unnecessary speed during the last part of the approach, though with four-position flaps it is difficult to see any possible reason for such manœuvres.

The approach can be carried out in an almost unlimited number of ways, varying from a flat, unflapped glide (using the flaps, by lever and/or pedal, to get rid of surplus speed at the very end) to a fully flapped semi-stalled glide started practically from a point above the aerodrome boundary. The Hammond's stall is almost entirely innocuous, and the worst that happens if the speed

Inside the cabin of the Hammond. The large lever extending from the floor boards operates the flaps—a pedal providing an additional 20 degrees of movement for gliding angle and/or speed adjustment. The little crank on the control column provides the fore and aft trim adjustment and this column may be swung over for right-seat flying.

is allowed to drop too far is a momentary dropping of the nose. Consequently, and remembering the limited elevator movement, it is possible to bring the machine in at 80 km/hr. (50 m.p.h.) with perfect safety so long as the vertical velocity is kept within reasonable limits.

For this reason, no doubt, a rate-of-descent indicator is part of the standard equipment, and its readings can be watched so that the undercarriage is not given more than it can take. It has been designed to deal with a maximum vertical velocity of 4½ metres a second, though a touch-down made at this indication should obviously be an entirely symmetrical one. Since there is not a very great measure of control at such low speeds it is obviously advisable to prevent this sinking speed from exceeding 3 metres a second. All of which is mentioned to explain the possibilities of the type and it is not suggested that normal approaches will ever be made in this manner; if, however, a pilot is incautious with his approach speed the machine should come to no very serious harm.

Needless to say, the machine being a pusher, the view in essential directions is excellent, but it is impossible to see directly backwards, and the necessary airscoop for engine cooling precludes the arrangement of a roof window. Consequently, the effect as a whole is that the range of vision is little better than average.

It would probably be fair to say that the Hammond flies on its ailerons alone no more effectively at normal speeds than one or two of our own light aeroplanes, but directional control is effective in this way right down to stalling point. On one occasion, misjudging the position of the end of a runway by a matter of two or three yards, I found no difficulty in making a complete S-turn at a speed of about 95 km/hr. (58 m.p.h.). In fact, the only curiosity of slow-speed flying with the Hammond concerns a shuddering of comparatively slow rhythm when the A.S.I. shows anything much less than 90 km/hr. This mild shaking occurs at a somewhat higher speed when climbing steeply on full throttle, and for the moment I thought it was a period in the Menasco engine. Apparently it is an effect of the airflow.

As a machine for the private owner's use the Hammond possesses certain minor disadvantages, the most noticeable of which is a comparative lack of lateral space in the cabin. This is somewhat exaggerated by the presence of a control column between the seats, and of the flap lever which, in order to provide adequate leverage for direct operation, is a very long one. Nor is the cabin really as quiet as it ought to be.

The somewhat natural impression of the person who sees the Hammond for the first time is that it is ugly. That may be so, but one becomes accustomed to its appearance, which at least is workmanlike, and it must be remembered that we have become used to machines of a very different shape.

In its standard form the Stearman-Hammond is fitted with full electrical equipment, including navigation lights and a self-starter, so the awkward position of the engine and airscrew is not, perhaps, so very important. However, generators fail and batteries run down, and one must feel a certain amount of sympathy for the pilot who might have to stand on the centre section and swing the airscrew by hand. But we put up with a complete lack of self-starting apparatus on the majority of our light aeroplanes. Nor are any of these perfect, so such complaints must be taken as an indication of the Hammond's excellence in essential arrangements.

STEARMAN-HAMMOND Y.

125 H.P. MENASCO PIRATE C-4*

Span	40ft.
Length	26ft. 11in.
Height	7ft. 7in.
All-up weight	2,150 lb.
Payload	480 lb.
Maximum speed	120 m.p.h.
Cruising speed (at 75 per cent. power)	110 m.p.h.
Stalling speed	40 m.p.h.
Cruising range	500 miles.

Distributors: N.V. Kon.-My. "De Schelde," Flushing, Holland.

* The machine dealt with is fitted with the supercharged version of this engine.

THE ITALIAN "FORMATION" ATLANTIC FLIGHT

6,250 *Miles in* 24 *Hours' Flying Time*

EQUIPMENT of British origin played an important part in last week's remarkable Italian formation flight over the South Atlantic—from Rome to Rio in two "hops."

The three Savoia-Marchetti S.79 bombers of the Regia Aeronautica were fitted with Pegasus engines built in Italy under licence; engine equipment included Claudel Hobson carburettors; and, as in the Damascus Race, in which a similar team triumphed, Smith's automatic pilots relieved the Italians of much strain, especially during stormy periods over mid-ocean.

Under the command of Col. Biseo, the other two machines in the flight were piloted by Capt. Moscatelli and Lt. Bruno Mussolini. Each aircraft carried a complement of five.

The three left Guidonia—Italy's "Farnborough"—on the morning of January 24 and, as reported last week, reached Dakar (Senegal) the same evening, having covered 2,800 miles at an average speed of 260 m.p.h. Strong winds and sandstorms were encountered over the Sahara.

The Italian Royal Air Force crews of the three Savoias. Lt. Bruno Mussolini is third from the left, back row. In the centre of the row is Col. Biseo, and Capt. Moscatelli is standing at his left.

Taking off from Dakar early the next morning, they struck out across the South Atlantic. The three kept their formation for the major part of the 2,000-mile crossing, which was made in 8½ hours—2½ hours less than the time set up by Codos and Reine last November. As they neared Port Natal, Biseo and Mussolini went on ahead; Moscatelli had been having trouble with one of his airscrews and, it is said, had made much of the crossing on two engines only. Biseo ordered him to land at Port Natal.

Biseo and Mussolini continued to their goal, Rio de Janeiro, having covered this second stage of over 3,312 miles in 13 hours, 35 minutes, an average speed of 245.5 m.p.h.

The complete flight of 6,250 miles had been accomplished in 24 hours, 20 minutes flying time (39 hours, 17 minutes overall).

R.A.F. Units Visited

No. 201 (General Reconnaissance) SQUADRON

By
Major F. A. de V. ROBERTSON, V.D.

(Illustrated by "Flight" photographs.)

Pilots of No. 201 on Calshot beach. Left to right: Sergt. Easton, P/O. N. L. Smith, F/O. D. K. Banks, P/O. D. F. Spotswood, Flt. Lt. R. A. McMurtrie, Flt. Sergt. Burdett, Wing Cdr. J. H. O. Jones (C.O., No. 201 Sqn.), P/O. A. C. R. Thomson, P/O. P. R. Woodward, P/O. H. J. A. Thewles, F/O. Bennett, Sergt. Briggs (rear), P/O. A. G. Wincott, P/O. C. S. Thomas, Sergt. Bannister.

THE office of the C.O. of No. 201 (G.R.) Squadron at Calshot is not exactly a palatial apartment. It provides welcome shelter from the searching winds of the Solent, and it is most certainly the scene of much admirable administrative work, but it does not exactly suggest dreams of marble halls. Yet on its almost dingy walls there hang some framed documents which make the pulse of the reader beat faster and take his thoughts from his surroundings to scenes of desperate endeavour and glorious achievement.

One of these documents is the original combat report written by Flt. Sub-Lt. R. A. J. Warneford, of No. 1 Naval Aeroplane Squadron, Dunkirk, June 7, 1915, and addressed to his C.O., now Air Marshal Sir Arthur Longmore, describing how he had attacked the Zeppelin LZ.37, dropped six 20-lb. bombs on her, and sent her down in flames. By the side of this report hangs the original telegram from King George V conferring the Victoria Cross upon the gallant officer. No. 201 Squadron claims descent from No. 1 Naval Aeroplane Squadron.

Another document of interest is the emblazoned copy of the Squadron's new badge, autographed "Edward, R.I." Not many squadrons had their badges approved during the short reign of King Edward VIII.

Coming out from the warmth of the office to the wind-swept slipways, one passes from the glorious past to a most interesting and meritorious present. One sees nothing resembling Warneford's Morane, but on the slipways and at the moorings are Saro London flying boats. The classification "General Reconnaissance" includes flying boats and Anson landplanes. This squadron has an establishment of six boats plus reserves. When it gave up the trusty old Southamptons it was first equipped with the London Mark I with Pegasus III engines, but it is now changing over to the London Mark II with Pegasus X engines.

The London II is a very nice boat, which cruises comfortably at 90 knots, and, with a normal load of fuel, including guns, but no bombs, has a range of about 1,700 sea miles. The top speed is not great, compared with the Empire boats of Imperial Airways, but it is by no

means certain that great speed is needed for flying boats in Home waters. At one time the boat pilots of the R.A.F. were inclined to hold that speed was what was chiefly needed round the coasts of Britain, while for overseas work long range was the great desideratum. But that was before the introduction of the Ansons. Now the fast work can be done by the landplanes, while for some of the classes of work which the boats undertake a high cruising speed would be rather an expensive luxury. Shadowing a fleet by day and night is work to be done at low speed, provided always that the flying boats can defend themselves against the attacks of the fleet fighters. Flying low will always disconcert fighters, and it covers up any blind spot that might exist underneath the hull. It is not easy to arrange a gun-port in the bottom of the hull, but if the fighter cannot get underneath that does not matter.

(Right) The moorings at Calshot. A Saro London of No. 201 Sqn. has just landed, while two more Londons and three Supermarine Scapas are moored out. The Scapas belong to the training squadron.
(Below) Two Mark I Londons in the air.

No. 201 Squadron has done some notable work in shadowing a fleet in the Channel.

One great point about the London is its roomy comfort. It carries a crew of six, and they can all sleep on board on perfectly adequate bunks. One can walk about inside the hull without indulging in gymnastics. One does not need to bump one's head or get a crick in one's back. In the old days, when the Southampton was the *dernier cri* among flying boats, the pilots' cockpits were open (apart from windscreens) to the winds of heaven and the waters of ocean. It was quite possible for the crew to get very wet when taking off in a choppy sea,

(Left) A London has just alighted and is taxying up to its moorings. (Above) Going down the slipway—a picture which gives a good idea of the rear gunner's cockpit and of the clear field of fire which is obtained from it between the twin rudders and fins.

though the pilots used to remark philosophically that they soon got dry in the cold air up above. Now that sort of thing is all past and gone. One may get wet in a dinghy going out to the moored aircraft, but once on board one is comfortable and cosy. The transparent cover over the cockpits keeps out the elements, and, moreover, the view is excellent.

Londons are much in the news just now on account of the cruise of No. 204 (G.R.) Squadron to Australia. No. 201 admits that it would have liked to have been selected for that job—who would not? But at the time of the start No. 201 had not received the latest mark of London, while No. 204 had been fully equipped with it. So the Calshot squadron remains the specialist in reconnaissance over British waters, and it has probably amassed more experience of our coasts than any other unit of the Air Force. It has advanced bases off Stranraer and Oban, and it spends much of each summer out on cruises. That is when the young pilots and their crews learn to become good nautical airmen. Everybody on a flying boat squadron has to be a handyman and to know as much about watermanship as about airmanship. The boast of the flying boat squadrons is that they are always self-contained, and, provided they find their supplies at the appointed places, they do not need help from any man.

The Training Squadron

Yet, like other squadrons in the R.A.F., No. 201 is largely staffed with Pilot Officers. The C.O. is a senior Wing Commander with much experience, but his officers are nearly all very young. When an officer or airman pilot passes out from his Flying Training School and is allotted to General Reconnaissance squadrons he first goes to Manston for the course in air navigation. If he is to be a boat pilot he then comes to Calshot, but not necessarily to join No. 201 Squadron. There is another squadron at that station, the Seaplane Training Squadron. It has one flight of Clouds, one of Scapas, and one of Swordfishes on floats. In that unit the pilot learns all that can be learnt (except, of course, that knowledge which only experience can teach) about the handling of marine aircraft on the water, taking off and landing. It is an old and true saying that when a landplane has landed its pilot's troubles are over,

The transparent covering over the pilots' cockpit in the London gives great comfort in flight, and in particular it avoids the chance of shipping water when taking off, which was a bugbear to the crews of some earlier flying boats.

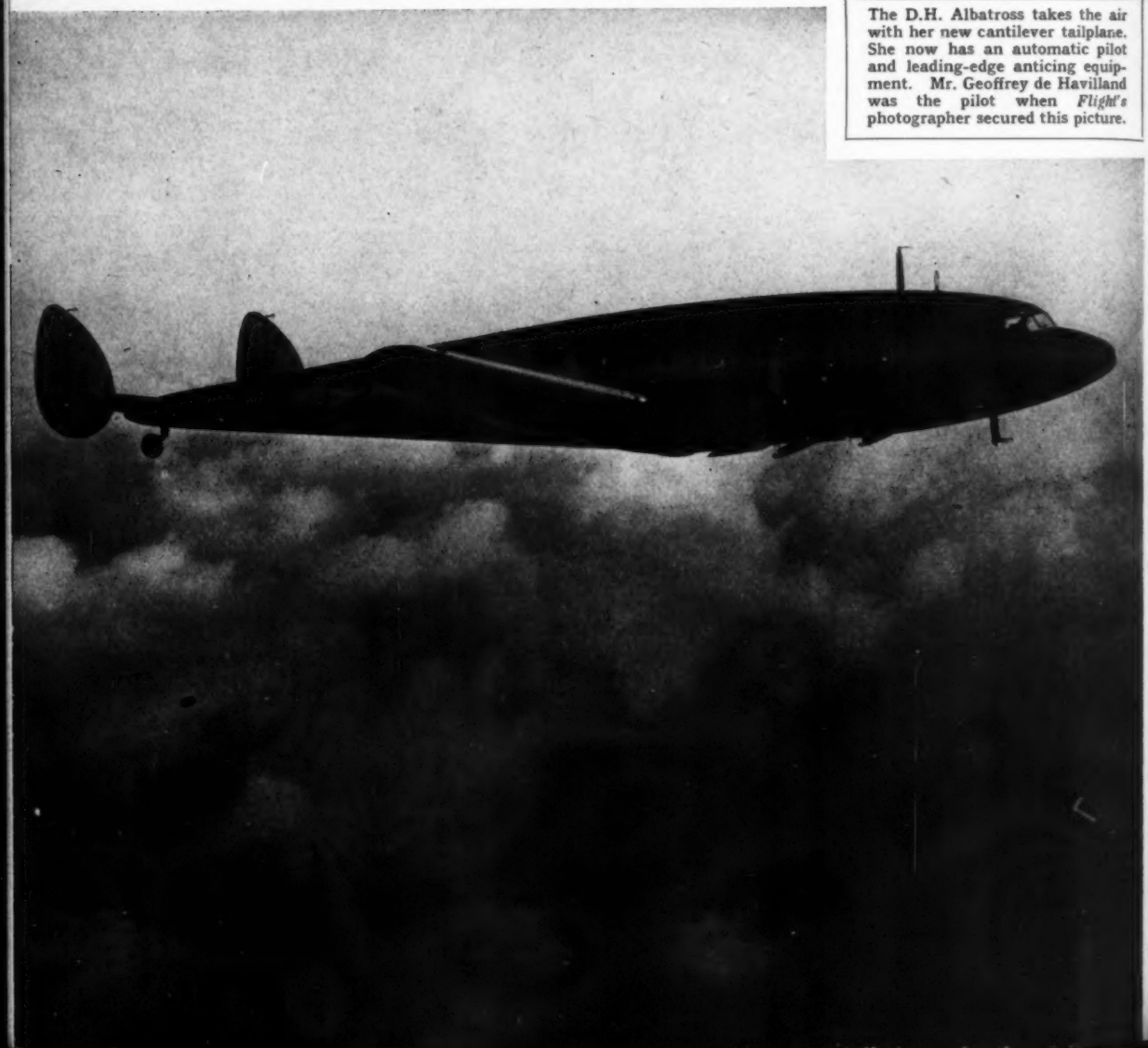
but that when a seaplane alights on the water the troubles of the crew have only just begun. The wind, most inconsiderately, will not always blow in the same direction in which the tide is running, and the infinite variations of the two set the pilot all sorts of mathematical problems which have to be solved instantaneously if everything is to go right. Modern flying boats ought to be able to take off and land in all but the very heaviest weather, but a dead, glassy calm has its own difficulties. When about to land on a glassy sea the pilot finds it very hard to judge his exact height above the water, and no counterpart to the tricycle undercarriage has yet been found for flying boats. To pick up moorings smartly is an art in itself and requires much practice before perfection is attained.

For eight weeks this squadron initiates the young pilots into the mysteries of all these arts, and then they are posted to flying boat squadrons, either at Home or overseas. This training is very good, and the pilots join their squadrons with a full theoretical knowledge and a good deal of practical experience. But it is when the squadron goes on cruises that the pilots and their crews really grow proficient in flying boat work and all its intricacies.

The airmen of No. 201 Squadron are also an interesting lot. Very few of them are ex-apprentices from Halton, and most of them have come into the Service by direct enlistment. The instrument makers and wireless operators mechanics are naturally ex-apprentices from the Electrical and Wireless School at Cranwell. The squadron does not work on the system of fitters and mates, but has flight mechanics and flight riggers. If one wants to know what smartness means one should watch the airmen of No. 201 (G.R.) Squadron handling Londons up and down the slipways at Calshot.

A HANDSOME CRAFT ENHANCED

The D.H. Albatross takes the air with her new cantilever tailplane. She now has an automatic pilot and leading-edge anticing equipment. Mr. Geoffrey de Havilland was the pilot when *Flight's* photographer secured this picture.



TALKING-OVER the TRICYCLE

Three-wheeled Undercarriages Debated at Length by R.Ae.S. Members : Some Valuable Opinions

THE tricycle undercarriage held the stage almost to the exclusion of other subjects at last Thursday's resumed discussion of the papers by Mr. H. F. Vessey and Sqn. Ldr. H. P. Fraser, read before the Royal Aeronautical Society on November 18 and December 2 respectively. There could be no doubt that the general feeling at the meeting was overwhelmingly in favour of the tricycle undercarriage. The opposition, if such it could be called, was confined to one speaker, Capt. F. S. Barnwell, whose views will be found reported in their proper place in the discussion.

MR. F. HANDLEY PAGE was in the chair and asked Mr. D. L. Hollis Williams to open the discussion.

MR. HOLLIS WILLIAMS pointed out that, by a coincidence, papers on high wing loadings and tricycle undercarriages had been read and discussed very close together in point of time. It was, however, no coincidence in reality that the two subjects should be taken together. There was a close connection between them. The modern tendency to high wing loadings was curbed by the problems connected with making contact with the ground. The fitting of tricycle undercarriages made it possible to increase the wing loading by reducing the skill required in landing a machine. He defined the meaning of the expression " tricycle undercarriage " as any undercarriage, irrespective of the actual number of wheels used, which reduced the angle of incidence.

The advantages of the tricycle undercarriage were: Good view, directional stability on the ground, reduced swing if one engine stopped, less skill required for landing, and the possibility of landing with a considerable vertical velocity instead of zero vertical velocity. The disadvantages were an increase in structure weight and an inconvenient installation, as the nose wheel would have to retract into part of the fuselage which was usually required for a turret or a bomber's window.

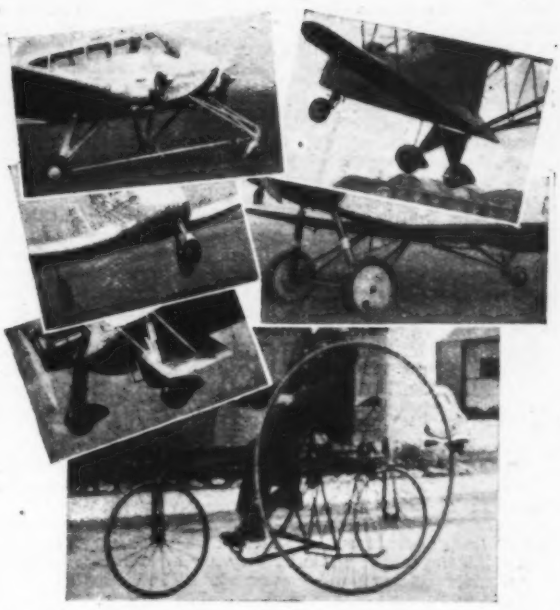
He put to the meeting the proposition that the need for three-point landings was fundamentally wrong and should be abolished.

Paying For It

CAPT. F. S. BARNWELL pointed out that the great advance in performance had been due to an increase in wing loading. The increased performance had made it necessary to use variable-pitch airscrews, and the increased loading had demanded flaps for reducing the landing speed. Neither of these things improved performance by itself but was necessary. He thought they ought to make very certain that the tricycle undercarriage was necessary. If the operators wanted tricycle undercarriages designers would certainly provide them, but it should be remembered that the front wheel would add about 2 per cent. of the gross weight. As the payload was usually about 20 per cent. of the gross weight, this meant that the front wheel would reduce the payload by 10 per cent. or so.

By fitting a tricycle undercarriage the advantage of the use of the wings as an air brake was lost. Much had been made of the increased braking effect that could be obtained from a tricycle undercarriage. What was chiefly wanted was the power to manœuvre on the ground, and on large commercial machines it could quite well be arranged that the differential action of the wheel brakes was improved. To stop any tendency to swinging during taxying, the tail wheel could quite easily be so designed that it was locked central when that was desired.

MAJ. F. M. GREEN thought too much had been made of the risk of landing aircraft. If past civil aviation history were reviewed, he wondered how many accidents one would find which had been caused during landing. He admitted that in a fog the tricycle undercarriage was an advantage. If the front wheel were fitted one would have to make very sure that it never failed in any circumstances. He thought that even a comparatively trifling matter like a burst tyre on the front wheel would be just as serious, if not more so, as a burst main tyre.



MR. L. E. COWEY, by way of explaining the advantages of his particular type of tricycle landing gear, in which the third wheel is behind the main wheels, read lengthy extracts from an article which appeared in *Flight* of June 18, 1936. He added that since that time his firm (British Landing Gears, Ltd.) had made a considerable number of experiments. As to the relative merits of the single-wheel-in-front or single-wheel-behind type of tricycle undercarriage, Mr. Cowey said that one advantage of the single-wheel-behind type was that the wheelbase was longer, so that the machine should be more stable on the ground. Any tendency to ground-looping which might be present owing to the position of the two main wheels fairly far ahead of the c.g. could be cured by stiffening the castering action of the rear wheel. With the single wheel behind, the braking action was better because the two front wheels were ahead of the c.g., and when the brakes were applied extra weight was thrown on to these wheels. He also referred to the difficulties of retracting a front wheel, particularly in a single-engined aeroplane.

MR. B. SHENSTONE wondered if the tricycle arrangement with single wheel in front did not cause the machine to swing into wind during a glide landing. For use in the Fleet Air Arm he thought the front wheel might be a disadvantage in that it would probably cause the machine to run sideways across the landing deck if the deck was sloping through rolling of the carrier.

MR. R. L. ALSTON pointed out that Mr. Shenstone was wrong in thinking the tricycle undercarriage would cause a swing into wind. On the contrary, the tricycle undercarriage was stable on the ground, and if the machine was landed with side-drift on, the tendency would be for it to swing into the direction in which it was drifting. It was different on board ship, where the machine would, as Mr. Shenstone had pointed out, have a tendency to run off the deck. While it was true that skilled pilots managed to land the present-day aircraft quite satisfactorily, it was in bad weather conditions that the tricycle undercarriage was of the greatest advantage, and then even skilled pilots might be glad of it. In case of war it was to be assumed that pilots would not be so highly skilled as they were in peace time, and then the tricycle undercarriage would be a very considerable help.

Misapplication

Mr. Alston was sorry that all the new devices which had been introduced seemed to have been used for extending the speed range at the top of the scale. He hoped the tricycle would not be used in the same way, but that, on the contrary, it would be used to improve matters at the lower end of the speed scale. He did not quite agree with Capt. Barnwell that the increase of 2 per cent. in weight was serious. The tricycle type of undercarriage would enable heavier loads to be taken off, and this would more than pay for the 2 per cent. lost. He concluded by regretting that we had no machines in this country of the sort comparable with the Hammond Y type. Perhaps our constructors thought the subject one of no importance, but he did hope that the Royal Aeronautical Society

would see to it that we got something of the same sort in this country.

F/O. J. K. QUILL thought that the tricycle undercarriage was definitely a good thing, but many new machines were flying without it in spite of their high loading. Hitherto the discussion had centred entirely around the tricycle undercarriage. He thought Sqn. Ldr. Fraser's paper deserved some discussion also, and said that the approach with a flapped aeroplane would be facilitated by the tricycle. Heavily loaded aeroplanes should, he thought, be brought in on undershooting and engines Getting heavily loaded machines down might not be easy, but it could be done, and so long as designers saw pilots doing it they would continue to give them as high wing loading as they could handle. Even experienced pilots found it difficult to glide in at night at a steep angle and to flatten out at exactly the right moment. Less experienced pilots would probably be in trouble in such circumstances. Landing by one's own landing lights was difficult because the beams chased ahead of the machine across the aerodrome and finally, at the moment one touched down, they pointed into the sky.

SQN. LDR. D. F. ANDERSON said that during the last war the period of a pilot's training which took the longest was teaching him to land. He thought the tricycle undercarriage would definitely help in reducing the time necessary.

WING CDR. H. V. ROWLEY said he had recently tried Mr. Hollis William's tricycle undercarriage on a Monospar, and although he was not very enthusiastic when he started, he returned an absolute convert. He agreed that the tricycle undercarriage would cut down the time of training, and did not think the weight mattered very much. Finally, he asked for the views of any pilots present who had tried both types of tricycle undercarriage, the single wheel in front and the single wheel at the back. He had not personally tried both types.

"Shimmying"

DR. G. LACHMANN said he was "sold" on the tricycle undercarriage, but there were a few points he wanted cleared up. For example, which was preferable, the steering or the castering nose wheel? He had noticed that the new large Douglas in America had a steerable nose wheel. The Americans had stated that "shimmying" of the front wheel had to be guarded against, as it was dangerous. He would like to know if it was worse than shimmying of the ordinary tail wheel. He pointed out that on a bumpy aerodrome the front wheel might be thrown off the ground. Would the pilot be able to retain control?

MR. P. P. NAZIR thought it unwise to talk of increased wing loadings until full use had been made of devices available for improving control and for altering the gliding angle. One such device was his cut slot and trailing flap. He showed two lantern slides, from articles reproduced some time ago in *Flight*, of the spreading of the stall on rectangular and tapered wings and of the change in air flow when the Nazir cut slot was fitted.

MR. W. E. GRAY was somewhat amused at this sudden interest in the tricycle undercarriage in view of the fact that he patented one many years ago but failed to get the aircraft industry interested, including the firm of the chairman of that evening (Mr. Handley Page).

CDR. R. R. GRAHAM, R.N., said that perhaps it was slightly out of order for him as a serving officer to express an opinion, but he thought that from the pilot's point of view there was nothing to choose between the front-wheel and rear-wheel tricycle undercarriage. He had tried both. He suggested that the type should be adopted which fitted best into any given design. For deck landing the tricycle was definitely easier than the ordinary undercarriage.

FLT. LT. P. LUCAS said his ideal of an easily controlled approach and landing was to motor in in a high-drag aeroplane fitted with tricycle undercarriage. He suggested the use of a reversible airscrew as an air brake.

MR. F. M. THOMAS thought the greatest advantage of the tricycle undercarriage was in connection with fog landing, which was made practicable by this means.

MR. NIGEL NORMAN referred to the question of landing on runways. If the wind were at an angle to the runway, the c.g. of the aeroplane would be travelling parallel with the runway even if the aircraft was pointing off to one side. With a three-wheeled undercarriage the machine would, as soon as the rear wheels touched, swing its nose along the runway and would not run off. He pleaded for runways on British aerodromes, but said it was difficult to get people to see the necessity so long as it was held that turfed aerodromes sufficed. He caused a good deal of merriment by suggesting that the pilot of a large machine ought to be placed below the fuselage and behind the undercarriage. From there he would be able to judge his height over obstacles much better than if he were stuck out in front of the machine "on the end of a long banana," as in the Handley Page H.P.42.

Progressive Air Brakes

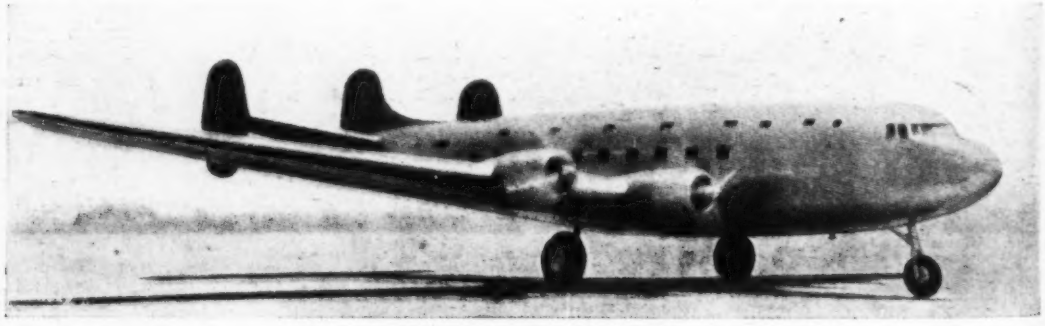
FLT. LT. H. ST. G. BURKE had not, when flying the irreversible control advocated by Sq. Ldr. Fraser, found it to give any trouble, contrary to expectations. He thought it was worth designers' while to give it a trial. What was wanted was some form of control with very high drag, which could be put on lightly or hard as circumstances demanded. He likened such a control to the brakes of a car, and landing an aeroplane with air brakes was like driving a car without brakes. One did not *always* use the brakes of a car to come to a screeching halt, but it was useful to have the brakes capable of this in an emergency. So also with aircraft one should be able to reduce speed to the required degree. Super pilots like Mr. Bulman did not need such devices, because they could bring any machine into any field just above the stall, but ordinary pilots would appreciate the air brake.

MR. F. D. BRADBROOKE expressed the opinion that the tricycle with the single wheel behind was inferior to that with a front wheel because of its tendency to cause ground-looping. He thought the tricycle undercarriage needed a runway to give the best results. The Hammond Y-type aeroplane with limited elevator control had a tendency to unstick like a cork coming out of a bottle, and needed a little care in avoiding stalling during the steep climb after unsticking. He agreed with Mr. Nigel Norman that the difficulty of landing over obstacles was directly proportional to the pilot's distance from the ground when the machine was stationary.

SQN. LDR. FRASER strongly advocated a variable-drag device. It reduced the skill required and ought to be tried. Whatever they said there that evening about tricycles and air brakes, in the end the matter would be decided by the pilots. [Incidentally, it might be mentioned that the use of a variable air-brake has been vigorously pressed by our contributor, "Indicator," during the past year or two.—ED.]

MR. C. M. BARTER pointed out that "shimmying" was cured on motor cycles by steering dampers, so why should it not be similarly cured on aircraft front wheels?

MR. H. F. VESSEY did not agree with Capt. Barnwell that the front wheel would necessarily add extra weight. By permitting a greater load to be taken off, it paid for itself. He thought that if used in conjunction with a powerful rudder the rear-wheel tricycle might be better for deck landing, as there would be no tendency to run down the sloping deck.



The first application of the tricycle undercarriage to a big commercial aeroplane—the forthcoming 40-passenger Douglas D.C.4. The photograph appears to have been made with the aid of a model.

THE FOUR WINDS

ITEMS OF INTEREST FROM ALL QUARTERS

WING COMMANDER : This Fleet Air Arm officer is not, as appears to be the case, trying to emulate *Mercury* of the Short-Mayo combination ; he is merely ready to hook the Supermarine Walrus on to the derrick tackle of H.M.S. *Shropshire*. Somebody seems due for a wallow in a minute !

THE Segrave Trophy for 1937 has been awarded to F/O. A. E. Clouston for his flight from England to South Africa and back in 5 days, 17 hours, 28 minutes. The trophy is presented for the most meritorious performance on land, sea or air.

A.V.-M. R. Williams, Chief of the Australian Air Staff, has been appointed to represent Australia at the opening of the Singapore naval base.

Organised by the Jugoslavian Royal Aero Club, an international aircraft show is to be held in connection with the Belgrade Fair, May 28-June 7.

A four-seater version of the Fairchild 24 high-wing monoplane has just been announced. Top, cruising and landing speeds are, respectively, 138 m.p.h., 125 m.p.h. and 49 m.p.h.

Four Douglas D.C.3s shortly to be delivered to K.L.M. are to have fully feathering Curtiss airscrews. Tests with the Schwartz type of feathering airscrew are also being made by the company.

Mr. H. J. Wilson has been appointed deputy Press and publicity officer at the Air Ministry under Mr. C. P. Robertson. Mr. Wilson was formerly news editor of the *Morning Post*.

In 1937 the Air Communication Group of the Legion of Frontiersmen, Northern Command, flew 609 hours, 35 minutes. On several occasions pilots of the Legion have co-operated in the training of A.A. brigades of the Territorial Army.

Imperial Airways report (and corroborate with a photograph) that an Empire flying-boat lady passenger, at Malakal, caught five large fish with a piece of string and a bent pin. Which seems to raise the query: When a flying boat is also a fishing boat, what extra logs, licences, and so forth have to be carried by the captain?

In 1937 Holland imported 3,620 cwt. of aircraft and parts (including 25 complete machines), valued at £372,067, as against 1,280 cwt. (including 10 complete machines), valued at £102,590 in 1936. Fifteen of the machines came from America and five from Great Britain.

An Italian Savoia Marchetti S.74 high-wing transport with four Alfa-Romeo 126 r.c. 34 engines (Pegasus type) flown by Giuseppe Tesei and Lino Rosci has beaten the International speed record for aeroplanes over 1,000 km. with a load of 10 tons, attaining an average of 322.089 km/hr. The former record was held by a Farman.

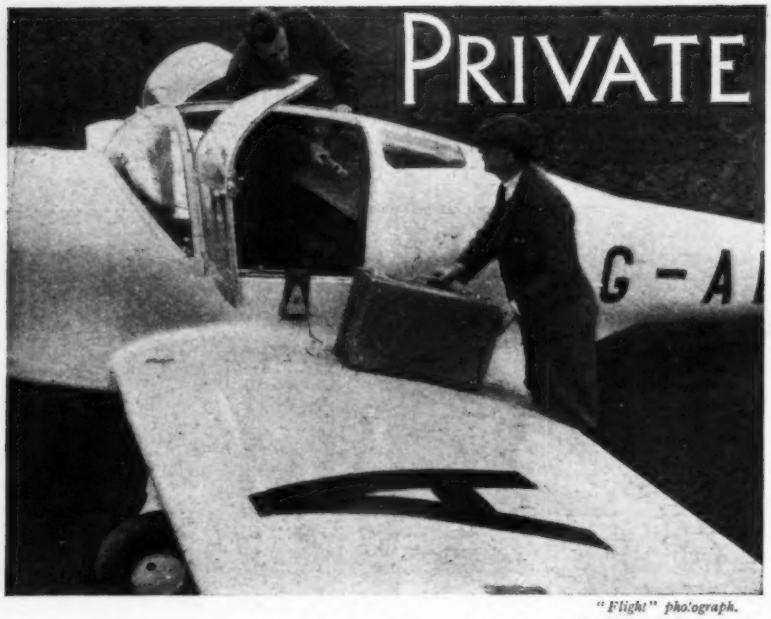
The index to the July-December, 1937, volume of *Flight* is now available and is obtainable at 7d., including postage, from Flight Publishing Co., Ltd., Dorset House, Stamford Street, London, S.E.1. Binding cases, together with an index, are 4s. 4d., postage included.

Certain alterations have been made in the R.Ae.S. lecture programme. On April 21 Prof. J. E. Younger, of California University, will speak on "High-altitude Flying," and the lecture originally fixed for that date is postponed until April 28 (see Diary, p. 119). The February 17 lecture ("Maintenance of Civil Aircraft") is postponed.

"Flight" photograph

TAIL-PIECE : A close-up of the full cantilever tail of the D.H. Albatross. The rudders have been placed at the extreme tips, and the tailplane has a sharp dihedral. The modification is intended to ensure positive stability under all conditions of flight—this is particularly important for blind take-offs over a wide range of loadings and load dispositions. A striking new flying picture of the Albatross appears on page 108*d*.

PRIVATE FLYING



"Flight" photograph.

SPECIALISED LUGGAGE: One way of overcoming the luggage accommodation difficulty. Specially built and fitted suitcases are designed for the production model of the C.W. Cygnet, some flying impressions of which appear on pp. 112-114.

Topics of the Day

Air Brakes Again

NOW that the good (or bad) old days of the conventional biplane, with its coarse approach angle and capacity for indefinite sideslipping, appears to be numbered save for training purposes, it becomes more and more certain that real thought will need to be extended on the development of new ideas in flap gear. So far as the variable air brake is concerned mine is no longer a voice crying in the wilderness—that is, if the interest in this kind of device may be gauged from the way in which the subject has cropped up time after time in recent Royal Aeronautical Society lectures and discussions.

The two primary needs in both small and large aeroplanes are high lift for the take-off and high drag for the approach and landing. There is nothing new about this demand, but the layout of flying machines does appear to be so much in the hands of very superb test pilots and extremely conservative designers that there can be no harm in saying it all again. More important still, this high drag must be variable—and both safely and quickly variable at that. Some of the most modern transport aeroplanes possess flaps of an efficiency which, coupled with the effect of an unfaired undercarriage, make the approach angle tremendously steep and yet, once the flaps are fully down, it is not safe to lift them up again.

In the aforementioned lectures and discussions various possible methods of achieving this desirable variation in drag have been put forward. There are quite a number of ways in which the matter can be tackled, but in the present state of design perhaps the most natural is to arrange the flaps so that a certain useful degree of movement towards the full down position can become solely of drag-varying interest, whilst the first thirty or forty degrees are concerned only with lift increase. Needless to say, whatever specially controlled movement is allotted to the business of approach adjustment, this must not be such as to change the lift characteristics of the aeroplane. Most of us know the feeling experienced as flaps of normal design are retracted suddenly when flying near the ground; the effect is that of losing about a couple of hundred feet, though, in fact, the loss is really quite slight. Nevertheless, the effect can be extremely dangerous with little speed to spare.

Action . . . .

AS a means of personal education I recently attempted to record all my actions and my reasons for such actions while bringing in any flapped low-wing monoplane of unfamiliar type. By so doing I hoped to obtain a better understanding of the difficulties which were still experienced, particularly by the pilot who had been brought up on training biplanes with their capacity for making what in air traffic rules is alluded to as "acrobatic landings"—in other words, sideslips, swishtails and the various tricks which one invents on the spur of the moment in order to lose height and/or speed.

My first action is to fly parallel to the leeward boundary at a height which seems quite ample for a motorless approach, however steep. The throttle is then closed, the nose pulled up till the speed has been brought down to that at which it is safe to apply the flaps—and a surprisingly long time this can take with a modern type.

Attempts at judging the approach angle, particularly in a strong wind, leave me at one moment with a feeling that the machine is going to sit firmly on the aerodrome boundary fence, and at another that it just not going to get into the aerodrome at all, this change of opinion occurring regularly throughout the approach and usually according to the slight variations in speed.

Partly to assuage fears that a piece of undershootment is in progress, and partly to ensure that the motor (which is so often necessary as an assistance during the first approach and landing with a strange machine) is still functioning as it should, the throttle is opened from time to time—or even left a little open during the entire approach. Only when the boundary has been crossed and the church spires, telegraph wires, housetops and what-not are well behind, is this throttle finally ignored and attention concentrated on keeping the air speed at a constant figure. Meanwhile, again, the far boundary appears to be astonishingly near, though the landing is almost invariably made with a good two-thirds of the aerodrome still available.

. . . . And Reaction

MY reason for flying alongside the leeward boundary is the obvious "right-angle approach" method of keeping this boundary in view the whole time without getting too close to it. The first danger concerns the need for pulling the machine up so steeply in order to lose speed without unreasonable delay.

The novice might very easily overdo this and then add a fatal chunk of extra drag by pulling the flap-lever up with the nose still miles above the horizon. Although the better kind of modern low-wing machine has a particularly easy-going straight stall, especially when the flaps are down, the danger is present, and my first suggestion is that the speed which is customarily fixed as a limit for safe flap operation should be very much higher; in other words, it should be usual for the flaps to be applied almost as soon as the throttle has been closed from level flight.

What may be called the speed-sink ratio of the modern aeroplane is quite pronounced, whereas in the old days a machine rarely started to sink much before the actual stall. This characteristic tends to make the judgment of height and distance more difficult, in spite of the fact that the use of flaps has steepened the natural approach angle.

The danger here is, of course, that the engine might fail to pick up after undershooting, and, in any case, a genuine forced landing must be a very hit-or-miss affair. This has always formed the primary reason for my demands for safely adjustable air brakes.

INDICATOR.

FROM the CLUBS and SCHOOLS

LONDON

The flying time for last week was 43 hr. 10 min. and one new member, Mr. W. G. Battersby, has joined.

C.A.S.C.

High winds curtailed work during Sunday morning, but 6 hr. 20 min. were flown in the afternoon. Mr. A. W. Thorpe passed the ground instruction tests.

STRATHTAY

During the week ended January 23 high winds resulted in four non-flying days. For the rest of the week, however, 10¼ hours were recorded. Mr. F. Robinson is a new pilot member.

BARTON (BEDS)

The clubhouse of the Bedford School of Flying is in the gentle hands of decorators and furnishers and will be ready, in its new garb, in a fortnight or so. New flying members were Messrs. J. A. Unwin and A. R. Dixon.

HAMPSHIRE

Of the 42 hr. 5 min. total for flying during the week ended January 28, 2 hr 5 min. represented night work contributed by Messrs. P. J. Grenside and J. Laurie-Dickson during their "B" licence flights from Croydon to Southampton.

NEWCASTLE

The Newcastle Aero Club held a lunch patrol at Woolsington on Sunday, January 30, when four machines from Yeadon and one from Edinburgh attended. A cross-country flight was made to Aberdeen. Flying times were composed of 6 hr. 15 min. dual and 18 hr. 30 min. solo.

HERTS AND ESSEX

Owing to bad weather flying was possible only on eleven days of the fortnight ended January 27; the total time recorded was 100 hr. 2 min. New licencees included Mr. G. L. Parbury, who obtained his "B" licence, and Mr. D. Wright, who obtained his "A" licence. Several cross-country and night flights were made.

YORKSHIRE

The corporations concerned have now brought all their powers to bear on the matter and the terminal buildings at Yeadon should be completed by the end of July. The new hangars are under construction both for the A.A.F. and the club. Flying was again reduced to a minimum on account of the gales, but the times to the 29th totalled 50 hours.

CINQUE PORTS

Despite bad weather over the week-end the total flying hours for the week ended January 30 amounted to 46. It is intended to hold the Parslow Cup competition again this year. It will be open to all members holding an "A" or "B" licence, and is a cross-country competition, including pin-pointing and forced landings, and is run on handicap.

HYDERABAD

There was a considerable amount of flying activity during the month of December when as many as four members made their first solos. These were Lieut. G. H. Campbell Colquhoun, Lieut. Balwant Singh, Mr. Syed Abdul Khader, and, last but by no means least, the first woman in Hyderabad to do so, Miss A. P. Chenoy. The total flying for December was 92 hours 25 min. The membership now reaches 67.

HULL

The flying time for 1937 totalled 722 hours—a drop of nearly 500 hours on 1936. Although it is not likely that the 1936 figure will ever be repeated, it was rather disappointing to the club. The committee hopes that members will do their best to give the club plenty of support this year. There will be two more dances before the onset of Summer Time. The dates to be remembered are February 26 and March 26.

HANWORTH

A landing competition will be held at Aldenham aerodrome on Sunday, February 20, for "A" licence members of the club. Applications for tickets for the dance at the Hanworth Park Hotel on Friday, February 18, should be made as soon as possible. The flying programme for the first half of 1938 will be available shortly. It was unfortunate that high winds rather effectively curtailed flying last week but, even so, 34 hr. 50 min was logged.

MONTREAL

More than a thousand hours were flown by the Montreal Light Aeroplane Club during last year, and seven members obtained their private pilots' licences. In addition, one commercial licence was obtained, another is in the offing, and six night-flying tests were passed. The club participated in several competitions during 1937, and Mr. D. Nesbitt won the Lytell Trophy. Dr. D. D. Mowry, the retiring president, has been succeeded by Mr. Dougal Cushing.

BORDER

The gales which have been sweeping over the country have caused January to be the worst flying month experienced in two years by the Border Flying Club. To January 29 only 35 hours had been flown. The aerodrome levelling has now been completed, but it will be necessary for the obstruction flags to remain for some time yet. Experiments are being made with a new type of obstruction flag which, it is hoped, will be an improvement on the old one.

MARSHALL'S

Although, with the prevailing high winds, no flying was done on January 29, the flying times at Marshall's School during last week totalled 47 hours. New members were Messrs. M. M. Clews and C. Fahnestock.

NORTHAMPTONSHIRE

The Northamptonshire Aero Club's annual dance, which was held last Friday, appears to have been a great success. Something like 200 members and friends turned up at the Salon de Danse, Northampton, where the necessary music was supplied by Tony Linnell and his band from Leicester.

KARACHI

Recent successful "A" licence candidates were Lt. D. C. Lyall and Mr. Ogilvie; the latter also held a British "A" licence. A "B" licence was obtained by Mr. M. A. Choksey. Despite the adverse weather conditions experienced in Karachi, the total flying time for December was 159 hr. 10 min. Capt. Wyatt carried out an inspection of the seaplane base and airport.

BENGAL

A special flying gymkhana was held on December 19 in honour of the visit of Their Excellencies the Viceroy and the Marchioness of Linlithgow. Over 600 members and guests attended, to say nothing of the public lining the sides of the aerodrome. On the arrival of Their Excellencies three machines flew in formation. The prize-winners were Mr. E. C. Phillips (bomb-dropping), Mr. A. Ghose and Mr. C. V. Graham (aerial golf), Mr. R. Wilson (height judging). As a finale the French air mail arrived and made a night landing. Mr. R. B. Das has completed his tests satisfactorily. Several cross-country flights were made and 51 hr. 15 min. was spent in the air.

MADRAS

As the secretary of the Madras Club puts it, "a right powerful splash of rain one night, six inches deep and accompanied by some tiny fishes, was practically the total of the December wetness," but this did not greatly interfere with the flying. The month appeared to be notable mainly for cross-country flights, and, in particular, for one by Mr. Shenoy, who, with an instructor, visited Cochin, his home town, travelling *via* Trichinopoly. Thence, pursued by a monsoon, he flew directly over the 9,000ft. peak of Anamudi, the highest point in India south of the Himalayas. They landed on a reclaimed island in Cochin Harbour, the landing ground having been prepared by a local private owner. On the way back they flew right in to the monsoon and eventually crept into Trichy along a railway line. During the month the club's fleet was increased by one, with the second resurrection of the Gipsy Moth VT-ACU, which is now equipped for night flying as well as for blind flying.

BROOKLANDS

The first of the new handicap competitions was flown off last Sunday. Competitors had to fly for seven minutes on a given course and at the end of that time pin-point their position on the map. They then had to choose their magnetic course and keep to it, and, as there was a strong cross wind, this meant a certain amount of quick thinking. In addition, competitors were marked on general flying, and a surprising number of marks were lost on the "little" things. The competition was won by Mr. Spooner who, handicapped by minus 6, scored 78 marks; Mr. Sewell was second (−25) with 49 marks, and third Mr. Nepean Bishop (−40) with a score of 48. The handicap system was to deduct half a mark for each solo hour over 10 previously flown with a maximum penalty of 40. "B" licence tests were completed by Mr Cornack, and Mr. Livingstone Russell is well advanced with his. Incidentally, there was a small slip in the sentence giving the Club's flying time in last week's issue. This should have read "70 hours were flown during the week, 20 of them on Sunday."

The Manx Races

IT has now been officially announced that the Isle of Man air races will be held on the week-end of June 4-6. Capt. Rex Stocken is again taking charge of the organisation, and it may be remembered that the Isle of Man authorities have given a grant of £500 for this flying week-end which, during the past two years, has been so markedly successful and is looked on by the competitors and practically everybody else as the most cheerful flying event in the year's calendar.

Opening and Closing

WITH the official opening, as far as the Air Ministry is concerned of Worcester's new civil aerodrome, and the closing of Sherburn-in-Elmet aerodrome, the landing ground position in this country remains temporarily unaltered. The new Worcester aerodrome lies 2¼ miles on a bearing of 145 deg. true from Grimley Church and the take-off runs vary between 975 and 600 yards.

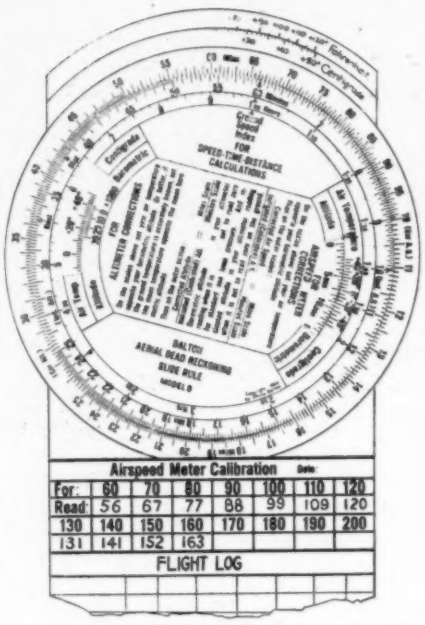
Incidentally, there appears to be some misunderstanding about the lengths of the runs at the new Barton aerodrome in Bedfordshire. The Air Ministry *Notice* concerned gives one run, for instance, as 415 yards, while International Aircraft say that this should fairly be given at 535 yards.

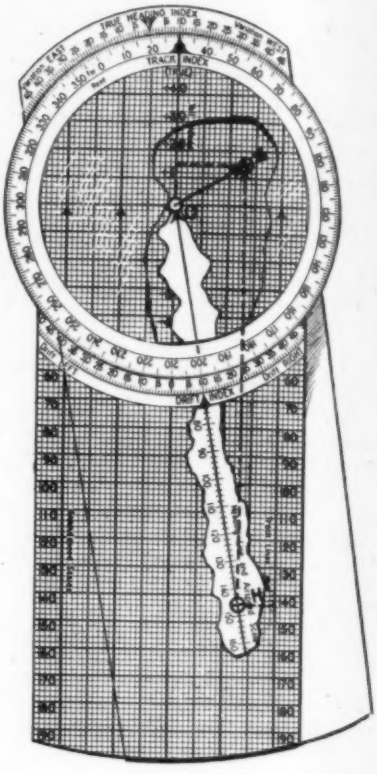
MORE MECHANICAL D/R

Using the Dalton Mark VII Computer : Multiple Calculations Made Easy

THE amateur pilot on his little excursions requires hardly more than an intelligently used proportional calculator for his exercises in dead reckoning, and the commercial pilot certainly should not need to be told about anything which is not entirely new in the way of calculating machinery. Nevertheless, there must be a number of pilots who take their navigation with sufficient seriousness and yet who do not have the chance of seeing any new computing machinery as it makes its appearance.

Of comparatively recent manufacture, at least in this country, the Dalton Computer, which is now used by Imperial Airways' pilots and, in a somewhat modified and involved form, by Service pilots, is a typical example of such modern machinery. It would be true to say that with this instrument anything from a plain drift allowance to the correction of indicated airspeed and/or altitude—which must be made in order that the simple initial calculation may be quite correct—can be carried out by the Dalton in little more than the time required to read this sentence. Certainly, and without exaggeration, it is the best implement of its kind to come my way. After practice work, lasting perhaps an hour or an hour-and-a-half and covering all the problems which are likely to be met in the ordinary course of navigation, this computer may be operated more quickly than any other such device which I have previously tried, and it can, if necessary, be worked accurately with one hand only.





These sketches show (left) the circular slide rule at the back of the Dalton Computer and (right) the side of the instrument used for normal plotting. The disc and the grid piece have been cut away and a simple vector diagram has been drawn to show the principle of operation.

The somewhat lengthy experimental period was explained in my case largely by the fact that it does not "manufacture" velocity triangles in quite the form with which we are familiar in the case of the ordinary C.D.C., and also by the sheer number of the different calculations which may be made. Furthermore, the explanatory booklet which has been produced by the manufacturers, Henry Hughes and Son, Ltd., has, to some extent, apparently, been reprinted from similar material produced in the country of its origin, the U.S.A., where the problems of navigation are possibly attacked from a somewhat different angle. However, once the simple basic principles have been grasped, the very complete markings and explanations on the instrument itself should effectively prevent any possibility of future misunderstanding.

Interception Problems

Briefly, the face of the calculator, consisting of a rotating bearing disc, of a rectangular transparent grid piece, and an almost plain white base, is used simply to produce vector diagrams with the magnetic variation allowed for on the true heading index at the top of the instrument. A suitably graduated line on the base piece acts as the compass course, while one or other of the marked lines on the grid-piece provides the necessary track line and ground-speed scale. The wind is drawn in with a pencil from the centre of the plotting disc in the direction in which it is blowing, i.e., in the reverse direction from that in which it is given in meteorological reports. This use of pencil marking has certain advantages, one of which is that the direction and speed of the wind, once graphically recorded, can remain on the disc during a day's flying and all other calculations are the work of a moment.

The double-drift type of problem, which involves the estimation of drift on two different headings and the consequent calculation of wind-speed and direction, can also be particularly quickly and accurately carried out, while interception problems, of a kind which I had never previously troubled to attempt, could be worked out in rather less than a minute. As a matter of interest and to check detailed accuracy, I drew four velocity triangles and two interception quadrilaterals to a very large scale, measured the results very carefully and afterwards carried out the same calculations on the Dalton. None of the figures obtained varied between the two by more than a degree or, at the most, by 2 m.p.h. Needless to say, these problems by no means exhaust the possibilities even of this side of the calculator.

On the other side there is the usual proportional calculator in what, to me, is a new and much-improved form. The scale is, in fact, continuous and the calculator is virtually a circular slide rule. No multiplication is necessary where figures higher than a certain limit are being used, and anything read off is correct, whatever the variation in proportion, except for the position, of course, of the decimal point. In addition, an inner circle of figures on the rotating disc gives the equivalent number of hours, starting at 60 minutes (or 1 hour) on the scale proper, and ending at ten hours. Inside the disc there are altitude and air-temperature scales which, when suitably adjusted in relation to one another, permit one to read off the true airspeed or altitude against those indicated on the instruments.

Below the calculator there are A.S.I. calibration tables to be filled in and space for a flight log, while above the disc is a Centigrade-Fahrenheit proportion scale. Any pencil marks made on either the plotting disc or on any part of the backpiece may either be rubbed or washed out. Inside the bearing scale of the plotting disc the necessary space is provided for permanent compass card corrections, in the case of a particular machine, and the actual compass course may therefore be read off against the magnetic variation mark without the need for any further corrections. The device is handled by Smiths Aircraft Instruments.

INDICATOR.

[We hope shortly to be able to publish a description of the new Dalton Model G Computer, which works on the same principles but is especially designed for very quick and accurate work with one hand.—ED.]

COMMERCIAL AVIATION

Proportion: **The first A.W. Ensign, now at Coventry, with a few attendants from the A.S.T. school fleet at Hamble.**

THE WEEK AT CROYDON

More "Records" : New Inventions : Farnborough Again : Omni-directional : Any Port in a Storm

WE have had more gales fit to tear Croydon up by the roots. Some pilots thought it better to travel hopefully than to arrive, so they landed at Lympne and places. Others, disapproving of the modern mania for speed, took one look at wind force reports and decided that, with the available flying stock, it would be a retrograde step—oh, definitely!—to fly at all.

There was, of course, a lot of "one-way record breaking." Air France grabbed the blue riband of the Straits of Dover on Saturday morning, and lost it in the evening to British Airways.

Capt. Denis Slocum, of the latter company, held it for a space the week before last, and broadcast, consequently, in "In Town To-night." This worthy, when not breaking records, lives his life according to his own ideas. After flying, he leaps into a high-speed sports car and seeks a sequestered bachelor cottage about ninety miles from the airport. There he cooks for himself and smokes a contemplative cigar over a book. In the morning, around dawn, he ups and does a spot of gardening before making the return trip to the airport for duty.

Afterthoughts

The Airports Conference afforded me with some amusing thoughts. Most of the things so earnestly advocated are daily routine at places like Croydon or Heston, and one wonders why airport owners do not study existing organisations instead of inventing the stuff all over again. Two things were advocated, I noticed, which have been urged in *Flight* in the past. One was the covered departure platform which even the poor railroad passenger gets, and the other was the airport information bureau. The first of these is essential to remove that primitive business when "luxury travellers" walk across a rain-swept area, and covered wagons and what-not are no proper solution to this evil. As for the second, it is neither difficult nor expensive; it would not be vastly unpopular, nor would it constitute a menace to traffic, and, therefore, I do not expect the authorities to adopt the idea at Croydon. There is, in fact, no kick in the kiosk idea, for, being a reasonable one, there would be no opposition to it.

But the opposition to these comic pylons and things makes their sponsors feel all grim-jawed and totalitarian, with perhaps an occasional fit of the dithero-jitters when the word "responsibility" is mentioned. We are told that no further cubits will be added to the pylons' stature, and that the matter is receiving earnest consideration. It is not consideration that is wanted, but just demolition. One imagines that this is the mysterious process of saving face, but, really, some faces are better lost.

You and I may rise each morn with the equally reluctant lark, whose song at this time of the year, heard faintly through the fog, is all about chilblains on his feet and ice formation on his wings. Farnborough, however, arises once and for all from its long winter sleep about the time that pretty harbinger of ant-icing devices, the snowdrop, pushes a white, scared face through the soil. Sure enough, no sooner had I tripped over the first snowdrop than the balloon went up from Farnborough, trailing 300ft. of cable behind it, and went dodging around seeking whom it might devour amongst the ever-increasing throng of transport machines.

Airline people are becoming unreasonably fussy about these free balloons for, after all, they are not much more dangerous than a lot of floating mines in a busy shipping channel, and who would grumble at that? Farnborough will be hurt and surprised to learn that its well-known popularity has received a bit of a setback in civil aviation circles over this apparently harmless little jest. There are those who expect an apology, but, unlike our little friends the Japanese, the Nabobs of Farnborough do not apologise after an "incident." Mind you, I'm all in favour of Farnborough, and I have taken endless trouble to suppress "canards" to the effect that this balloon (launched by Prof. Monty Golfer, of the Royal and Ancient Establishment) is the completion of a hot-air experiment started a century ago and then shelved until it came up again in strict rotation. Nor do I altogether believe that the basket contained a cock, goat, small ass and lightweight highbrow waving a red flag.

High-Speed Secrets

On Sunday the French technical mission arrived by Air France. Its five members will study British methods of air industry and production in factories at Bristol, Birmingham and Southampton. The secret of high-speed production, as so strikingly evinced by our shadow factories, may, it is thought, be revealed to them.

British Airways have just taken delivery of a new Junkers Ju. 52 for their night mail service, and North Eastern Airways, who contemplate an intensive flying programme for next summer, have placed an order for two D.H. Rapides.

Some airline people were alarmed by the new directional system of air traffic control (described in *Flight* last week) because it seemed to allow loopholes for mild private owners and ferocious military gents to fly all over the air routes in weather beyond their capacities, not only as the crow flies, but backwards, sideways, upside down and vertically like tumbler pigeons who have been at the brewery malt heap. Malt aside, though, I don't think anyone, even if permitted, would go a-pleasuring by air in dirty weather, especially where big aeroplanes were apt to barge into

them unless his lawful occasions compelled. You and I don't go joy-riding in our cars in thick fog, whereas bus drivers have to carry on.

About the repairs to what the authorities call "B" shed and what the tenants have come to refer to as "B—— shed," which remains unroofed. I think I owe the Ministry an apology for supposing there must be a clause in the contracts between them and the tenants whereby the landlord undertook to keep the place in reasonable repair. I learn that there is no such foolish clause in agreements prepared by our landlords. Why do tenants sign such outrageous documents? Why did Harold sign on the dotted line when a guest of good, kind Duke William of Normandy? The Ministry not only has a monopoly of hangar accommodation, but also, more by accident than design, I am sure, has arranged an acute housing shortage, so people sign anything to get under cover, even if the cover is but partial and riddled with holes.

The gale played postman's knock with the poor old terminal block, which swayed and opened its seams like a barnacle-encrusted three-decker in a storm at sea. I am not exaggerating when I say that quite a nice-sized lump of plaster fell from my office ceiling on to my brow, hence, perhaps, these wild words. I am saying nothing about it in case the authorities charge me for a scalp massage.

A. VIATOR.

D.L.H. in Indo-China

THE Eurasia Aviation Corporation, which is quite strongly connected financially with D.L.H., has started the operation of a weekly passenger and mail service between Hankow and Hanoi, in French Indochina, via Sian, Chengtu and Kunming.

Two Anniversaries

IT is almost exactly nine years since the first Imperial Airways machine flew with passengers and mails to Karachi and five years since a similar service was started between England and Cape Town.

Considerable changes have been made in the interim and in those days the services were of a rather mixed nature, passengers being carried by train between Paris and Brindisi. Nowadays Empire boats fly through to Durban and to Karachi and in the summer these boats should be going through to Australia. The all-mail-by-air scheme, which is already in action on the African service is due to be extended to the Indian service on February 23.

To St. Moritz

NOT very long ago one of Swissair's D.C.2s was flown from Zurich to the new St. Moritz airport at Samaden, thus opening a new chapter in the operation of the service. During last summer the airport, which is at a height of 5,500 feet, was improved and a new hangar constructed to take machines of the D.C.2 size.

A number of test take-offs had been made with different loads before the Douglas was put on this service, which has been previously operated with the smaller D.H. Rapide, purchased for such operations. This high-altitude airport will also be used for military training and, for the present, no radio facilities are available and the service is, consequently, considered as one for fine weather conditions only.

West African Survey

ON Thursday of last week the British Airways survey party returned to London after examining aerodrome sites and harbours in Sierra Leone, Gambia and other parts of the West Coast of Africa and Portugal. The party consisted of representatives from British Airways and from the Air Ministry, and certain selected pilots have already started a course of training in preparation for eventual trans-oceanic flying between West Africa and South America.

It would seem that the party has been confirmed in the opinion that, for the moment at any rate, it would be more easy to organise a landplane service than one for flying boats. Their report will, of course, be laid before the Air Ministry, and the Government will then start the necessary negotiations, which will be all the more difficult, since two other companies, D.L.H. and Air France, have already been operating over the route for such a considerable time.

"Error of Judgment"

AN interesting theory has been put forward to explain at least one recent flying accident in Europe. It concerns the ocular difficulty of distinguishing between sky and snow-covered ground and, in particular, the fact that the retina momentarily retains an image. White-line take-offs provide a special instance, and the possibility of ocular failure suggests that all bad visibility take-offs should be carried out on the instruments alone—which can at least be watched without serious changes of focus.

Incidentally, the unofficial explanation of one of the recent "approach" accidents in Europe is that the machine concerned, a Ju.52, is inclined to suffer elevator control loss if the throttles are suddenly opened wide when the flaps are in the landing position. Whether or not there is any real truth in this explanation, it must certainly be said that during the glide at normal throttle openings and at any load, the Ju.52 is, with its flaps up or down, one of the pleasantest transport aeroplanes in the world from the pilot's point of view.

The A.W. Ensign

ON January 26, two days after its first test flight, the first of the Armstrong Whitworth Ensigns was flown to Coventry aerodrome to complete its tests. During this cross-country flight, Flt.-Lt. Turner-Hughes raised the undercarriage for the first time in the air, and it has been reported that the cruising speed was well up to expectations.

And In America

FOLLOWING the formation of our own Cadman Committee, it is interesting to find that there are at least rumours of the formation of a somewhat similar group of enquiry in the U.S. This commission will probably consist of five independent persons, each of whom is experienced in some branch of the aviation business.

There is a firm move in America for the institution of new air transport legislation and for control by a separate semi-judicial body.

An Air France Speed Up

A REMARKABLY good time was put up by the Dewoitine 338, on which M. Allegre, director-general of Air France, and M. Foa, the commercial manager, flew to Saigon a fortnight ago. The machine covered the 2,320 miles from Damascus to Karachi in 12 hrs. 25 min.—an average speed of 181 m.p.h.

This is the second of the five D.338s allocated by Air France to the Eastern route, which is now to be run to a schedule of 5½ days for the 8,000-mile journey from Marseilles. M. Louis Allegre's visit has been undertaken with the object of familiarising himself with conditions along the whole route to Saigon and Hanoi in pursuance of his policy of gaining first-hand knowledge—a policy which has already taken him seven times across the South Atlantic.

Service Training

THE company's Scandinavian run, which can be quite difficult during the winter months, has been selected as that on which the first batch of Service pilots will fly as supernumeraries with British Airways.

It will be remembered that some time ago the Air Ministry decided that selected groups of R.A.F. pilots would be given training with air transport companies. The navigational and radio methods used on this particular service were, incidentally, thoroughly described in an article which appeared in *Flight* of December 23, 1937. The training scheme as far as British Airways are concerned was due to start at the beginning of this month.

Imperial History

THE political and operational history of Imperial Airways was the subject of a lecture delivered by the general manager of the company, Lieut.-Col. H. Burchall, D.S.O., before the Royal United Service Institution on Wednesday of last week. In this lecture he outlined the development of commercial aviation since 1919 and explained very adequately the reasons why Imperial Airways had been forced to do their very best to make ends meet rather than to attempt to put speed before all else. Present-day conditions, however, had demanded certain changes in this policy, and Lieut.-Col. Burchall went on to explain the beginning of the Empire air mail scheme with its present and likely future developments.

During the lecture a number of slides were shown to indicate the progress in traffic returns and afterwards a film was projected, this telling something of the story of the Short Empire boat. There was no discussion, but one question was asked about the possible utility of the airship. The lecturer replied that such aircraft could only be considered as satisfactory for use over very long distances which must be flown non-stop if the best results were to be obtained. At the present moment this type of non-stop service was neither necessary nor useful on the Empire routes.

Air Vice-Marshal Sir Philip W. Game was in the chair.

CORRESPONDENCE

The Editor does not hold himself responsible for the views expressed by correspondents. The names and addresses of the writers, not necessarily for publication, must in all cases accompany letters.

A PUSHER PROBLEM

IN one or two recent "pusher" designs I observe that the perpetrators thereof do not seem to be in the least worried by the fact that enormous side areas forward of the c.g., superficially, at any rate, do not appear to be anything like balanced by the outrigger and rudder surfaces provided aft. How does this affect stability?

I happen to be rather interested in "tail-less" designs and in such types this matter is very acute; it is very difficult to secure good seating accommodation in the nose without getting the centre of pressure c.g. rather far back and being left with all the side area in front! G. M. PART.

Sussex

A.C. IN THE AIR?

I AM writing to ask you to broadcast the enquiry as to why low-voltage direct current supply of 12 or 24 volts is required on aircraft instead of alternating current at 120 or 240 volts at 360 or 800 cycles frequency.

It is well known that every ounce saved in the weight of the equipment on aircraft results in a greater payload for commercial earnings or, if it must be, more bombs for the purpose of destruction.

The devices required on a modern airliner include:—lighting, cooking stoves, coffee percolators, electric refrigerators, electric razors, hair-curlers, air conditioning, call buzzers, intercommunication telephones, illuminated sign warnings, undercarriage position warning hooters, flap indicators, wireless receivers and transmitters, television sets for amusement and landing indication, instruments, starters, anti-icing heaters.

On a modern fighting machine the uses of electricity are even more numerous and include the operation of gun turrets, heaters for high-altitude flying, and special instruments.

At the present time all the power for these devices comes from the old conventional idea of having a battery. Just as a car has a 12-volt battery, so has an aeroplane a 12- or 24-volt battery. The latter has been a quite recent concession to the poor designer of electrical aircraft equipment.

It is well known that alternating current can be converted to any voltage which the operator may require by means of the very simple apparatus of the transformer. If this transformer is designed to operate on 800 cycles frequency instead of 50 cycles, then the weight of the transformer and its copper conductors is reduced to one-sixteenth. By means of step-up transformers, rectifiers and filters, instead of the dynamotor, high-voltage supply can be obtained for the wireless transmitter, receiver and direction-finder. All forms of lighting and heating can be more readily operated from alternating current than from direct current, at any voltage and in any lamp, such as neon, argon, or filament.

Aircraft motors can be started electrically very simply by the inertia starter *via* an electric motor running at 20,000 r.p.m. The powerful landing lights can be made more cheaply and can be made to last longer using a higher voltage than 12 or 24, direct current.

Weight of Wiring

A modern airliner may carry 15,000 feet of electrical wiring. The weight of the copper conductors can be reduced to one-quarter or one-eighth of that required on the direct-current system. Petrol gauges, engine-revolution indicators, temperature indicators, gyroscopes, landing gear, flaps, combustion indicators, would all be easier to design and lighter in weight if only the supply current were alternating instead of direct. Even the hydraulic equipment could be driven by lightweight electric motors if it were not absolutely necessary to employ hydraulic oil pumps driven direct by the main engines.

Electric ignition by means of high-tension magnetos could be completely replaced by the high-efficiency mercury-tube generator.

There are applications of electricity on aeroplanes of the future too numerous to mention, but the imagination of the designing engineer, given the liberty and freedom of scope, can deal with them. The ever-present danger is that of clinging to old, worn-out ideas, and trying to apply systems which are basically incorrect to the ever-expanding needs of the practical aircraft designer and operator. There is now, perhaps, a repetition of history, the fight between the direct-current or Edison system of distribution and the alternating-current or Tesla system. There is hardly a direct-current system left in the world which has not grudgingly been retained by reason of the great sum of money involved in installing it. Perhaps, if it were fully recognised that a revolution in the electrical equipment of aircraft was long overdue, there might be greater imagination displayed in the specifications presented to the engineers who try to solve the innumerable problems connected with the control and safety of aircraft.

A few years ago one or two kilowatts of electrical energy was quite sufficient for the needs of an airliner. To-day the traveller will miss the convenience of an electric cigarette-lighter; and, if it is possible to supply the aircraft with ten or twelve kilowatts of amenities, it will surely pay to seek the means of doing so. F. P. WILLS, B.Sc., A.M.I.E.E.

London, N.W.2.

TALKING-OVER THE TRICYCLE—POSTSCRIPT

AT the R.Ae.S. discussion on January 27 [reported on pages 103-104.—ED.] two questions asked towards the end were not adequately answered, possibly owing to the debate having gone beyond its allotted time. As the chairman was obviously trying to bring it to a close, I refrained from making his task more difficult.

As the designer and builder of a nearly completed aeroplane incorporating the tricycle arrangement, I am naturally anxious that no criticism shall go unchallenged which can be fully answered. I have set out below the questions, together with my answers, which I hope you will be able to print in your journal.

Question 1: Will not an aircraft fitted with a tricycle undercarriage be unsuitable for deck-landing owing to a tendency to run overboard when the ship rolls, because of its inherent ground stability?

Answer: Surely what is good for the goose is good for the gander, and the unstable conventional undercarriage, under similar conditions, will also tend to run over the edge, only on the opposite side of the ship! This tendency is simply checked in both cases by the use of differential wheel brakes, or in the case of the tricycle undercarriage, more simply still by making the front wheel steerable. It was suggested that the short-coupled tail-wheel tricycle would be more satisfactory for this purpose. Surely, the ground-looping tendency, vouched for by several speakers present, is the last feature one would wish a machine to possess for the purpose of deck-landing.

Question 2: By placing a wheel in the nose of the machine does not the momentum of the aircraft, when brakes are applied, throw the weight on the front wheels, thereby tending to lift the main undercarriage with consequent loss of braking effect?

Answer: Anyone who has seen both types land will agree that the conventional type of undercarriage does not hold a candle to the tricycle for short-braked landing runs. The reason for this is that in the tricycle the brakes can be fully applied at the moment of contact. In other words, at the fastest period of the run.

If we consider for a moment the conditions of deceleration for braking, the advantages of high-speed braking become manifest. Assume that a constant deceleration is applied from 60 m.p.h. to 0 m.p.h., the same period of time is required to slow up from 60 to 50 m.p.h. as from 10 to 0 m.p.h., but during the former period eleven times the distance is covered. Even slowing up from 40 to 30 m.p.h. covers seven times the distance from 10 to 0 m.p.h. In this way the overwhelming advantage of braking on ground contact is manifest. Further, if braking is applied as the aircraft sets down, instead of experiencing the reduced vertical reaction spoken of in the course of the discussion, a reaction of two or three times the weight of the machine is available for braking for a short while at that part of the run where it can best be employed, for it must be remembered that the tricycle sets the main planes in the "no lift" attitude immediately.

Mr. Weick, of the N.A.C.A., who three years ago covered all the work done in this country during the last few months, put down his W.I.A.—a light pusher with a tricycle undercarriage—at 75 m.p.h. against a 15 m.p.h. wind and pulled up in 150ft. This was accomplished by landing with his main wheels fully braked and purposely landing heavily to get the maximum braking effect. What other type of undercarriage can approach such a performance? MORRIS B. ARPIN.

West Drayton, Middlesex.

IN BRIEF

MR. W. H. VETCH, 5, Tudor Court, Hanworth, Middlesex, wishes to get in touch with parents or others who have had experiences of air travel with babies.

IN PRODUCTION FORM

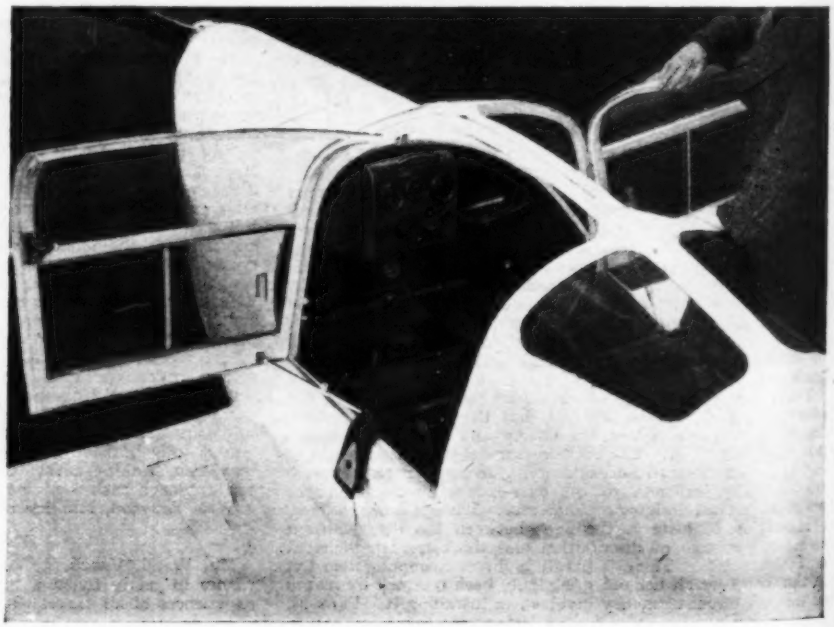
SINCE the Cygnet is the first all-metal light aeroplane to be produced in this country, it is somewhat natural that emphasis should previously have been laid on structural considerations. Now that the final version has been flying for some time, and that delivery of the first of a production batch can be expected in April or May, one can forget the interesting internals and treat the Cygnet simply as a flying machine designed for use by the private owner, the charter firm, or the club.

In any case, there have been no changes in the essential structure, in which Alclad, by Northern Aluminium, plays a large part, since the machine first made its appearance last year. There has been a slight increase in the rudder area and in the dihedral, improvements in the control system, and the cabin top has been entirely redesigned with a convincing change for the better in the general appearance of the machine. A very real attempt has been made in the design of this cabin top to give the pilot and the passenger the maximum possible range of vision, and to this end almost the entire surface as far as the rear of the luggage compartment is transparent. The transparencies, with the new moulded windscreen, are the work of Plastilume Products.

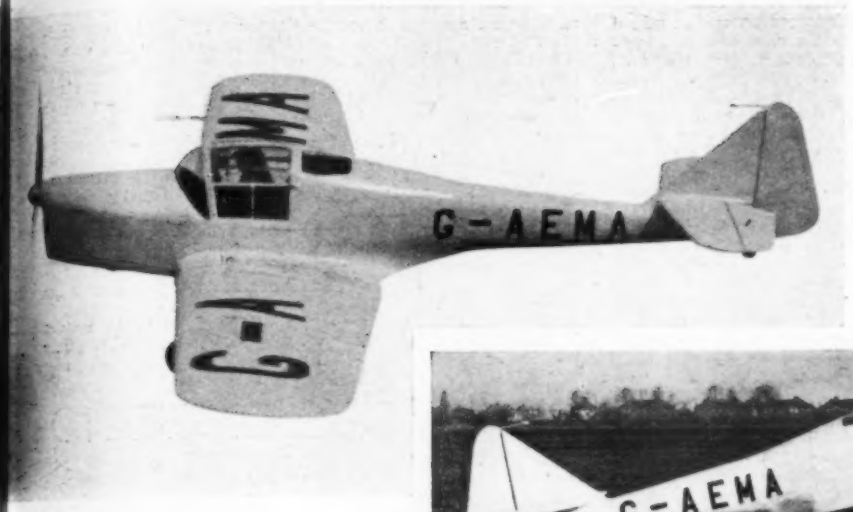
The occupants sit well forward so that the landing and navigation view over the leading edge is excellent, while it is possible to see over the entire rearward horizon before the take-off. The only slight failure in the range of vision concerns the tail-down taxying view, which demands a certain amount of rubber-necking (or occasional deviations from the straight path) in order to make sure that there are no obstructions on the port side. In order that there shall be plenty of head room consistent with low drag, the occupants sit fairly low down, but even so the nose cowling, in cruising attitude, lies well below the level of the horizon.

The stowing of different shapes and sizes of suit cases and the necessity for strapping them down firmly to make sure that they are not dislodged in bumps, is always something of a worry, and the designers of the Cygnet have dealt with the problem by the simple means of providing special suitcases of ample capacity which are placed firmly in recesses. In addition there is a long, narrow space behind the luggage compartment where, for instance, two sets of golf clubs may be stowed, and there is still ample room for all the odds and ends which are invariably added at the last moment. On both sides of the standard instrument panel are two sizeable lockers, each with a lid, and the one on the starboard side may be used, if necessary, for the disposition of any special blind-flying instruments, such as a Sperry panel, which the prospective owner may care to have fitted. The standard panel is supported on special vibration-proof Lord mountings which at the same time act as hinges, so that the entire panel may, on the removal of attachments at the top, be swung downwards in order that the connections may be inspected.

The arrangement of the controls includes normal dual rudder-bars with a single central control stick. Provision has, however, been made for the incorporation of two separate



The wide doors of the Cygnet may be fixed in any position by means of the adjustable stops, and this photograph also shows the neat instrument panel layout, with the easily seen and reached fuel tap immediately below it. The amount of transparent area is noteworthy.



Of the two flying pictures on the left one shows the Cygnet's two-piece flap gear in the "down" position while the other gives a good idea of its smooth lines with the new cabin top and production finish.

Below are two typical ground views, showing in each case the tidy cantilever undercarriage, which certainly gives an impression of ground stability.

The Final Version of the C.W.A. Cygnet Major : Special Luggage Arrangements : Air Impressions

By H. A. TAYLOR

(Illustrated by "Flight" Photographs)

sticks, and it is possible that the standard version of the Cygnet will be so equipped. There are certain objections to a central position for this important item and the tendency is for the pilot to fly and land with the left wing down.

In order that the cabin proper shall not be unduly encumbered, the direct-operation flap-lever is arranged immediately beside the seat in a suitable recess, while the Bendix type of "walking-stick-handle" brake lever is conveniently reached but not in the way, placed as it is below the throttle quadrant. The compass is mounted on the floor between the two occupants and the fuel control is in full view immediately below the dashboard, so that there is no possible excuse for leaving this tap in "off" position. Certain changes may be made later to the instruments, though their general arrangement will be unaltered. At the moment the Korect Depth Gauge people are responsible for some of them and it is possible that in due course they will turn out the entire equipment in suitably matched form. Soundproofing, Ltd., have been responsible for the general furnishing and soundproofing arrangements, and these, I believe, form their first successful essay in such specialised work.

Speed Tests

Since the first of the production machines made its appearance the weather has not been suitable either for speed tests over a measured course or for such tests as those for rate of climb. In its unfinished form the machine covered a two-way course on full throttle at about 146 m.p.h., and the smoothness of the final finish should add 2 or 3 m.p.h. to this figure. The pitot head had not, when I flew the machine, been tested for position error and the readings could not be taken too seriously. However, after giving the machine plenty of time to gather speed these were 120 at 2,100 r.p.m. and a little less than 140 m.p.h. on full throttle. The runs were made in air which was far from smooth at 3,000ft., and the corrected figures, for what they are worth, would be 126 and 146 m.p.h.

The bumps, which were directly caused by a fairly strong and gusty wind at lower levels and by the usual currents near the 4,000-foot cloud level, prevented any serious attempts at hands and/or feet off flying. The machine would fly with comparative accuracy on the stick alone, but the bumps caused a yawing motion which could not be immediately corrected. However, Mr. Wynne-Eyton, who has carried out all the more recent test flying, says that in smooth air the machine flies quite well without use of the rudder. At cruising revolutions a certain amount of rudder correction is required and it will be necessary to fit a rudder bias before the machine could be left to fly entirely happily by itself.

This wind, which was blowing at about 10 or 15 m.p.h. at ground level, also militated against any estimation of a take-off run. In the circumstances this run, when the machine was flown either two or one up, seemed to be well below the 120 yards which is officially given, and the machine can safely be pulled off the ground at or near the stall and will afterwards gather speed at quite a considerable climbing angle. I found that, contrary to usual low-wing characteristics, the machine would fly itself off if the take-off was made without lifting the tail too high. For the shortest possible length of run it would probably be better to hold the tail well up and to pull the Cygnet off the ground when the needle moved beyond the 40 m.p.h. mark.

The controls are smooth and nicely balanced and only at very high speeds were the ailerons at all heavy in operation. I did not fly the machine in its original form, but I am told that, though considered quite satisfactory at the time, the controls have undergone an all-round improvement.

Half-hearted stalling experiments at a very safe height (the machine has not yet been put through its spinning tests) showed that this stall, with flaps either up or down, was quite harmless and, if carried to its logical conclusion, resulted only in a momentary drop of the nose and, sometimes, of one wing. Aileron and rudder control faded out at practically the same moment, apparently a few miles an hour above the actual stalling speed.

A virtually infinite variety of positions is provided for the flap lever, and if the machine is not too near the ground or fly-

C.W. CYGNET.

130 H.P. GIPSY MAJOR ENGINE.

Length	24 ft. 3 in.
Span	34 ft. 6 in.
Weight empty	1,200 lb.
All-up weight	1,900 lb.
Maximum speed	150 m.p.h.
Cruising speed	120 m.p.h.
Stalling speed	45 m.p.h.
Rate of climb at sea-level	850ft./min.
Range	650 miles.

Makers: C.W. Aircraft, Ltd., Trading Estate, Slough, Bucks.

ing very slowly, this variety of positions can be used to adjust the approach angle without using the motor. The flaps do not extend right across but are in two separate portions, and, while being amply powerful for steepening the approach angle, are not so powerful that the pilot is left with little time to make an accurate hold-off or that the change of angle is dangerously great.

The process of landing is simplicity itself. The elevator control is gentle in its effect and there is a sufficiently marked lag to prevent any pump-handling. It is possible, by a very full movement at the last moment, to effect a tail-first touch-down, and after the first landing, which was slightly "one-two," I found that the most satisfactory landings could be made without using the entire elevator movement. The differences in elevator load between full throttle and closed throttle, with the flaps up or down, is very slight and, after setting the trimmer so that the machine flew level correctly at cruising revolutions, I did not use it again. In its present form the control, which consists of a small knurled knob working on a quick thread to tighten a spring, is inconveniently placed. This, however, is to be altered in due course.

It is almost impossible to make any fair judgment in the matter of noise, and most of that heard in the Cygnet cabin appears to be caused by the airflow. It is, however, possible to converse at the cruising speed without unduly raising the voice, and the arrangement of stops will prevent the windows from opening very slightly and thus increasing the volume of sound. On the ground the rear of the fuselage acts as a kind of amplifying trumpet for the noises made by the tail wheel and, until one becomes accustomed to them, it is difficult to resist the temptation to get out and look to see if the wheel is still there. At the present time Hanworth, where I flew the Cygnet, is very rough in parts, but the ample movement of the undercarriage legs smoothes things out once the tail is off the ground.

The price of the Major-engined C.W. Cygnet has not yet been definitely settled, but it is likely to be in the immediate vicinity of £1,200

AN AERONAUTICAL BENEVOLENT FUND

Proposal of Wide Scope : Society Registered

LONG overdue and badly needed, a benevolent fund for the aeronautical industry has at last come into being. Apart from charities necessarily limited in their application, such as the R.A.F. Benevolent Fund and the G.A.P.A.N. Fund, the aeronautical world has no organised means of helping those members of the industry who, through accident, illness or other causes, fall by the wayside, or who leave dependents in need of assistance. Certainly there is nothing comparable with the widely known Motor Trades Benevolent Fund.

Now, it is hoped, all that will be altered. The Aeronautical Benevolent Society and Trust, Ltd., was registered on January 20 as a company limited by guarantee.

With slight abbreviation, the objects of the Society are set out as follows:

"The Society has been established for the purpose of assisting necessitous members of either sex of the aeronautical profession and industry as well as allied trades who shall be British subjects, preference being given to those who have been subscribing not less than 5s. per annum to the Fund, and to the widows, orphans and other dependent relatives of such persons, by means of loan, gift, allowance, pension and otherwise and to assist (where possible) such members or otherwise, when unemployed, in obtaining employment.

"There are to be created two Trusts, one charitable and the other non-charitable, into which the collected funds at the absolute discretion and selection of the Board of Governors are paid and suitably invested.

"For the purpose of the rules the expression 'Aeronautical Benevolent Society and Trust, Ltd.,' shall be deemed to include and embrace the entire aviation movement, industries and trades (also allied); that is to say, all master-men or firms engaged in the production or the sale of any kind of aircraft (land or water) and the component parts and accessories of any of them.

"The benefits of the Funds shall extend to all those who are actively employed or have been so employed in the said trades or in any of the said departments in any of the following capacities:—Manufacturers, directors of limited companies, dealers, hirers (who derive their sole livelihood from the hiring business), pilots, instructors, commercial and sales managers, secretaries, clerks, salesmen, travellers, works managers, works superintendents, staff, foremen (non-productive), designers, draughtsmen, tracers and warehousemen, but excluding working foremen (productive), charge hands, mechanics, and all employees mainly engaged in actual manufacture or repair, except graduates and students of the Royal Aeronautical Society, the Institution of Automobile Engineers and students of the Institute of the Motor Trade.

"The benefits of the Funds shall also extend to fellows, members and associate members of the Royal Aeronautical Society, the Society of British Aircraft Constructors, Ltd., the Royal Air Force Club and the Guild of Air Pilots and Navigators, of the Institution of Automobile Engineers and the Institute of the Motor Trade, together with their employees who are not in any of the excluded classes as above, the editors, managers, canvassers, clerical staff and regular paid literary contributors to the aeronautical and allied press and (at the discretion of the Board of Governors) to others regularly engaged in writing upon aviation topics in the general and aviation press."

The preliminary organisation—when established the Fund will be administered by a board of governors and a grand council—is in the hands of Mr. E. C. Gordon England (whose good work in organising the Lowe-Wylde Fund will be remembered by readers of *Flight*), Major D. H. Kennedy and Mr. Frederick R. Simms.

It is stated that already powerful support has been promised.

Information may be obtained from Mr. F. R. Simms, M.I.M.E., M.I.A.E., M.I.Ae.E., M.S.E., at Simms and Co., Consulting Engineers, 42, Pall Mall, London, S.W.1.

At this time, with the aeronautical industry on a rising tide of prosperity, it seems fitting to hope that the proposition will be as generously supported as it deserves.

SAM'S FAIREY BATTLE

NOT the least entertaining thing at the second annual staff dinner and works dance of the Fairey Aviation Company (Stockport branch), held last Friday, was a "Sam Small" parody in the menu, describing Fairey evolution at the northern factory.

It was, in fact, so inspiring that we ourselves have been driven to report the function in the same style—with the customary acknowledgments to Mr. Stanley Holloway:—

'Twas in grand new Town 'All at Stockport
That second staff dinner were 'ad,
And all workers from factory Fairey
Turned oop for the dance to a lad.
All t' bigwigs assembled in foyer
And talked over sherry and gin,
'Till someone plucked up 'is courage
And shouted for guests to walk in.
Grace were said, then all got seated,
But no one would speak for a bit;
They looked 'ard at menu and napkin
And shuffled chairs sideways to fit.

But quite soon they all got acquainted,
Even them that was silent and meek,
And, judging from onslaught on t' chicken,
They 'adn't et owt for a week.
Major Barlow's were first of the speeches,
'E said that the party, once small,
'Ad grown much too big for Manchester,
So they'd 'ad to take Stockport Town 'All.
'E said, too, that staff pulled together,
And thanked all for what they 'ad done;
'E thought spice of life were variety,
And kept them young—each muther's son.

To wives 'e said, "Aircraft bug bites you,
And you cannot tell where it will lurk."
To prove it 'e spoke of one feller
Who got summonsed for speeding to work.
Mr. Turner gave toast to the Chairman,
So everyone started to sing,
'A jolly good fellow is Fairey,"
While t' latter sat there like a king.
Then oop 'e rose and responded
And said that from derelict shell
'Ad been made one of greatest achievements,
So Stockport had done jolly well.

On behalf of 'imself and directors
'E thanked everyone very much,
And said they were team wi' right spirit,
And must 'ave a good leader as such.
"Now leader, of course, is Tom Barlow.
'E's changed with 'ard work scarce at all,
Just 'is colour of 'air—while Wilf Broadbent
'As lost 'air and colour and all!"
Next named were Sharp, of Inspection,
With Faireys 'e might 'ave made war;
Instead 'e gave co-operation,
And no one there was that gave more

Then all was stern for a moment,
Tho' strains from t' band filtered through,
While country's position were thought on,
And chief told what Stockport must do—
It were not for the chairman and Faireys
That men must work 'ands to the bone,
But 'twas work that were vital for nation—
Government's work and their own.
Again thanking all up at Stockport,
Mr. Fairey told lads that he ought
To urge them to further great efforts,
For he feared time to be all too short.

M. A. S.

SERVICE AVIATION

Royal Air Force and Official Announcements — *Fleet Air Arm News : Military Aviation Abroad*

His Majesty arrives in the Royal Airspeed Envoy and salutes as the Royal Standard is broken.

The King at Cranwell

A BITING cold wind and a hard bright sun made Cranwell anything but a genial spot on Wednesday of last week, when King George flew over from Bircham Newton to inspect it. In his R.N.A.S. days, from November, 1917, until August, 1918, H.M.S. *Dædalus* was his station; he was then an administrative officer, and it was not until after the Armistice that he learnt to pilot an aeroplane. The house which he occupied while stationed at Cranwell is still in existence, and is known as York House.

Just on 11.30 a.m. the Royal Airspeed Envoy, painted in Guards colours of red and blue, appeared over the aerodrome, and when Wing Cdr. Fielden landed it a small Royal Standard was hoisted on the roof of the fuselage. The King stepped out, wearing the uniform of a Marshal of the Royal Air Force, and was received by the Chief of the Air Staff, Air Chief Marshal Sir Cyril Newall (who had flown up the night before in the Air Council's Rapide), by the A.O.C.-in-C. of the Training Command, Air Marshal Sir Charles Burnett, and by the A.O.C. of Cranwell, Air Vice-Marshal J. E. A. Baldwin. Cranwell now ranks as a Group in the Training Command, though it is not actually called a Group.

After inspecting the guard of honour of aircraft apprentices and boy entrants, His Majesty proceeded to carry out a very thorough inspection of the Cadet College and the Electrical and Wireless School. The College now has 144 Flight Cadets in residence, including one Indian. The E. and W. School, on the other hand, has been enormously swollen by the expansion scheme. There are now over 1,200 aircraft apprentices being trained as wireless operator mechanics and instrument makers (they spend three years at the school), while, in addition, there are in residence 700 boy entrants doing a course of sixteen months and over 1,300 airmen on a twelve months' course. Both these latter categories are being trained as wireless operators.

An interesting feature of the inspection was the parade of three Vickers Valentias which are used as flying workshops. Each is fitted with ten wireless sets, and in them the apprentices and boys get air experience. Further training in the air is given in Westland Wallaces. The King entered one of the Valentias and its equipment was explained to him.

The King also displayed much interest in the airmen's institute and the apprentices' institute, which are very comfortably fitted out. In the course of his tour His Majesty met one officer and five airmen who had been stationed at Cranwell with him. The officer is Flt. Lt. H. J. Adkins, who has retired, but has been recalled to uniform as a pro forma officer under the expansion scheme. The men were Flt. Sgt. W. Harris, ex-Warrant Officer J. Leyland, ex-Flt. Sgt. Marshal, and A/C.s C. Wryde and C. W. Wright. The last-named was once the King's batman. Mr. Leyland recalled how Prince Albert and he had both been in the team which had opened the rifle range at Cranwell, and the King said that he remembered it well.

His Majesty had lunch in the cadets' mess, and then inspected the College and the hospital. At 2.40 he embarked once more on his Envoy and took off. The departure was rather informal, and the thousands of airmen and boys who assembled round the aerodrome broke into wave after wave of spontaneous cheers which they kept up until the Envoy was only a small dot in the sky.

Higher Appointments

THE Air Ministry announces the appointment of Air Vice-Marshal Patrick Henry Lyon Playfair, C.B., C.V.O., M.C., to be Air Officer Commanding, No. 1 (Bomber) Group, Royal Air Force, with effect from February 21, 1938, vice Air Comdre. Sydney William Smith, O.B.E.

Air Vice-Marshal P. H. L. Playfair joined the R.F.C. from the Royal Artillery in November, 1912, having previously obtained the Royal Aero Club's aviators' certificate (No. 283 of September 3, 1912).

Except for a few intervals, he served in France throughout the War, during which he was awarded the Military Cross and was twice mentioned in despatches. Subsequently he commanded the C.F.S., the Fighting School, Netheravon, and the R.A.F. Base at Leuchars, and in 1925 was appointed Chief Staff Officer at Coastal Area H.Q. In 1928 he was appointed to command the R.A.F. in Palestine and Transjordaa and rendered distinguished service in connection with the disturbances in Palestine in 1929. From December, 1930, to September, 1932, he served at the R.A.F. H.Q., India, mainly as Chief Staff Officer, and in October, 1932, was appointed to command No. 23 Group, Inland Area. In September, 1933, he was posted to command the Wessex Bombing Area, and since May, 1936, has been Air Officer Commanding, No. 3 (Bomber) Group.

He was promoted to the rank of Group Captain in January, 1924, to Air Commodore in January, 1930, and to his present rank in January, 1934. He was appointed Companion of the Order of the Bath in the New Year Honours List, 1931, and Commander of the Royal Victorian Order in July, 1935.

The Ministry also announces the appointment of Air Comdre. Arthur Ashford Benjamin Thomson, M.C., A.F.C., to be Air Officer Commanding, No. 3 (B.) Group, Royal Air Force, with effect from February 14, 1938, vice Air Vice-Marshal Patrick Henry Lyon Playfair, C.B., C.V.O., M.C.

Air Comdre. Thomson was commissioned as a Second Lieutenant on probation in the R.F.C. Special Reserve in June, 1913, and in the following year was commissioned as a Second Lieutenant in the Royal Warwick Regiment and seconded to the R.F.C. He was appointed Major (temporary Lieutenant-Colonel) in the R.A.F. on April 1, 1918, and in August, 1919, resigned his commission in the R.A.F. with the rank of Flight Lieutenant.

During the Great War he served in France and was awarded the M.C. and bar, and the A.F.C., as well as being mentioned in despatches. He was appointed to command No. 39 Squadron in

Service Aviation

1922, and during the next year passed a course at the Armament and Gunnery School. In 1927 he was posted to H.Q. Iraq for Air Staff Duties, and after his return to the United Kingdom proceeded to H.Q. Inland Area for Armament Duties in 1929. He held the post of Assistant Director (Armament) in the Department of the Air Member for Supply and Research at the Air Ministry from January, 1930, until the latter part of 1933, when he was appointed to command No. 7 (Bomber) Squadron. In January, 1934, he was posted to command the R.A.F. Station, Worthy Down, and since December, 1936, has been in command at the R.A.F. Station, Cardington.

He was promoted to the rank of Wing Commander in 1929, to Group Captain in 1934, and to his present rank in 1938.

Moves of Squadrons

NOS. 35 (Bomber) and 207 (Bomber) Squadrons will move from Worthy Down to Cottesmore on April 20.

Nos. 51 (Bomber) and 58 (Bomber) Squadrons will move from Boscombe Down to Linton-upon-Ouse by April 20.

No. 218 (Bomber) Squadron will move from Upper Heyford to Boscombe Down on April 22.

R.U.S.I. Gold Medal Essay (Air)

THE subject of the gold medal essay of the Royal United Service Institution for 1938 is: "Discuss the influence which modern air forces may exert on British stategy in a major European war in which Great Britain is involved; and suggest what higher control organisation is desirable in order to co-ordinate the operations of the three services."

Commissions for Warrant Officers

THE following warrant officers have been granted commissions in the accountant branch: George Albert Cornish, Claude Henry Leggott, D.C.M., and Edwin Thomas Saunders, M.M.

The undermentioned warrant officers have been granted commissions as commissioned physical training officers: Harold William Beckett, John Samuel Sallows, M.B.E., Frederick James Stubberfield, and Albert Wellington Taylor.

Acklington Armament Camp

NO. 7 Armament Training Camp will open at Acklington, Morpeth, Northumberland, on April 1, on which date it will be placed in the Training Command in No. 25 (Armament) Group. The aerodrome may be used with effect from March 1 by aircraft of personnel visiting the station, but no facilities whatsoever will be available. The range at Druridge Bay will be available for use on May 1.

New Stations Forming

A STATION headquarters will form at Bassingbourn, near Royston, on March 27, on which date the station will be placed in the Bomber Command in No. 2 (Bomber) Group. The aerodrome may be used by aircraft of personnel visiting the station from March 1, but no facilities whatsoever will be available.

A station headquarters will form at Wittering on April 11 and take over the executive command of the station on May 16, on which date it will be transferred to the Fighter Command and placed in No. 12 Fighter Group.

Flying Accidents

THE Air Ministry regrets to announce the following accidents:—

P/O. David Lorraine Lloyd Morris lost his life and Sgt. Donald William Mansbridge was severely injured in an accident which occurred at Kingsclere, near Basingstoke, on January 24 to an aircraft of No. 51 (B.) Squadron, Boscombe Down, Wilts. Sgt. Mansbridge was the pilot of the aircraft and P/O. Morris was a passenger. Two other passengers of the aircraft, A.P/O. Cecil Wardman Poulter and Aircraftman 2nd class Ronald Harry Price, were slightly injured.

P/O. Alan Norman MacFarlane lost his life in an accident which occurred at Tattershall Thorpe, Lincs, on January 28 to an aircraft of No. 44 (B.) Squadron, Waddington.

A.P/O. Trevor Kearsley Goss Dudley lost his life in an accident which occurred at Ufford, Lincs, on January 31 to an aircraft of No. 11 F.T.S., Wittering, Northants. A.P/O. Dudley was the pilot of the aircraft and A.P/O. Peter Robert Burton-Gyles, a passenger, was slightly injured.

Lt. Richard Stratton Laybourne, Welsh Guards, F/O., R.A.F., lost his life in an accident which occurred near St. Andrews, Fife, on January 31 to an aircraft of No. 1 F.T.S., Leuchars, Fife.

Royal Air Force Gazette

General Duties Branch

F/O. M. H. de L. Everest is granted the acting rank of Flight Lieutenant (January 3). Sqn. Ldr. A. W. Hunt is placed on the half-pay list, Scale B, from January 11 to 12 inclusive and on the half-pay list, Scale A, from January 13 to 22 inclusive. Sqn. Ldr. E. A. C. Britton, D.F.C., is seconded for duty with the British Military Mission, Egypt (January 17). The following Flight Lieutenants cease to be seconded to the Royal Air Force on return to Army duty (January 15):—A. N. Malan (Lt., Royal Tank Corps), A. F. Anderson (Lt., Royal Warwick Regt.), R. B. Pakenham (Lt., Border Regt.).

Chaplains Branch

The Rev. G. A. Davies, B.A., is placed on the retired list at his own request (January 15).

Princess Mary's Royal Air Force Nursing Service

Staff Nurse Miss J. M. Mallalieu is promoted to the rank of Sister (January 9); Staff Nurse Miss E. M. Knox is promoted to the rank of Sister (January 12).

Royal Air Force Reserve

Reserve of Air Force Officers

General Duties Branch

The following are granted commissions as Flight Lieutenants in Class C with effect from December 14, 1937:—Capt. W. T. Clyde (Indian Army, Ret.); Capt. T. H. R. Riggs, D.C.M., M.M. (R.A.R.O.).

Royal Air Force Appointments

General Duties Branch

Air Commodore.—E. W. Norton, D.S.C., to H.Q., R.A.F., Far East, Singapore; for duty as Air Officer in Charge of Administration, 28.12.37.

Squadron Leaders.—L. B. Duggan, to No. 218 (B.) Squadron, Upper Heyford; to command, 4.1.38. E. B. Addison, to H.Q., R.A.F., Palestine and Transjordan, Jerusalem; for Air Staff duties, 20.10.37.

Flight Lieutenant.—R. A. R. Rae, to R.A.F. Station, Seletar, Singapore, 31.12.37.

Accountant Branch

Squadron Leader.—H. W. Capener, to R.A.F. Station, Dhibban, Iraq; for Accountant duties, 19.11.37.

Flight Lieutenants.—F. M. Hall, to R.A.F. Station, Dhibban, Iraq, 15.12.37. C. V. Mears, to H.Q., R.A.F., Middle East, Cairo, 8.12.37.

Medical Branch

Group Captain.—W. A. S. Duck, O.B.E., to H.Q., R.A.F., Far East, Singapore; for duty as Principal Medical Officer, 6.11.37.

Wing Commander.—H. W. Corner, to No. 1 R.A.F. Depot, Uxbridge; for duty as Senior Medical Officer and Officer Commanding R.A.F. Officers' Hospital, 6.1.38.

Flight Lieutenant.—L. M. Corbet, to No. 1 R.A.F. Depot, Uxbridge, 8.1.38. A. B. Marshall, to R.A.F. Station, Heliopolis, Egypt, 1.12.37.

Owing to the greatly increased length of these lists as a result of R.A.F. expansion, ranks are confined to those of Flight Lieutenant and above.

FOREIGN SERVICE NEWS

The "Coupe Deutsch" Fighter

PROCEEDING with a programme of development work on single-seater fighters based on the striking Coupe Deutsch layout, Caudron has produced the type C-713 with an inverted vee-twelve air-cooled Renault of 450/750 h.p. This model is derived from the C-710 but has a retractable undercarriage. Two shell-guns are mounted in the wings.

Sub-Stratosphere Speed

THE first publicity given to the performance of the special twin-engined Lockheed XC-35 monoplane supplied to the U.S. Army Air Corps for experimental flying in the sub-stratosphere concerns a 220-mile flight which occupied 38 minutes. Flying between 19,000 and 21,000ft. the Lockheed reached 350 m.p.h., carrying a crew of four. The pressure cabin rendered unnecessary the provision of oxygen equipment and heated clothing.

The machine, which resembles an Electra, was built early last year, and since August has been subjected to exhaustive tests at Dayton, Ohio. The fuselage is nearly circular in cross section and strongly reinforced, and the engines are special Wasps with exhaust-driven blowers.

Italian Aerobatics in South America

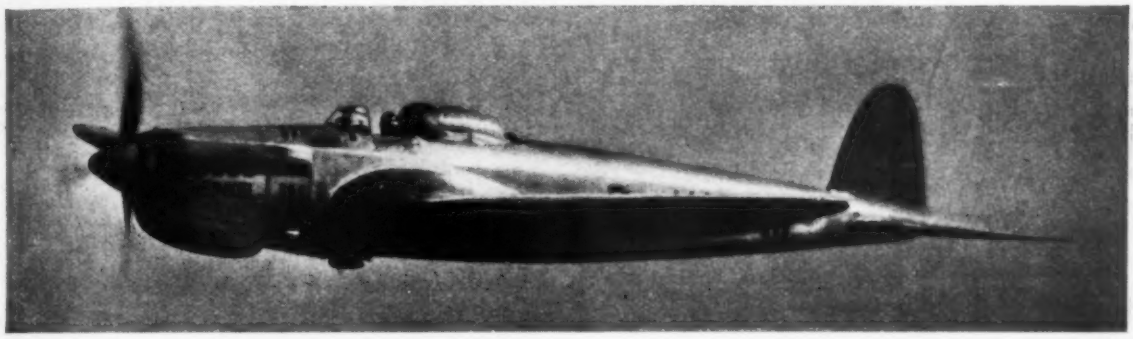
THE Italian aerobatic squadron which has been making a "good will" exhibition tour in South America, has evoked the wildest enthusiasm. Their show at Sao Paulo was witnessed by 500,000 people. The machines used are more or less standard Fiat CR 32 biplane fighters mounting the 550-h.p. liquid-cooled Fiat A.30 engine. This type has met with considerable success in Spain.

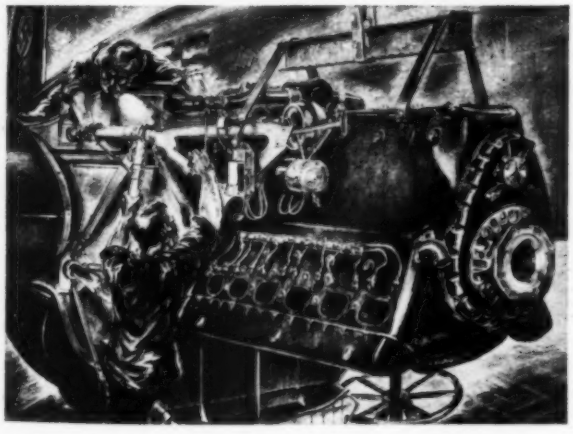
HEIL HEINKEL!

High-speed German Bombers with the New Inverted Vee-Twelves

(Left) Military-type He. 111 medium bombers which must do nearer 300 than 250 m.p.h.

(Below) A new Heinkel dive-bomber attack monoplane, surely one of the shapeliest aeroplanes ever built.

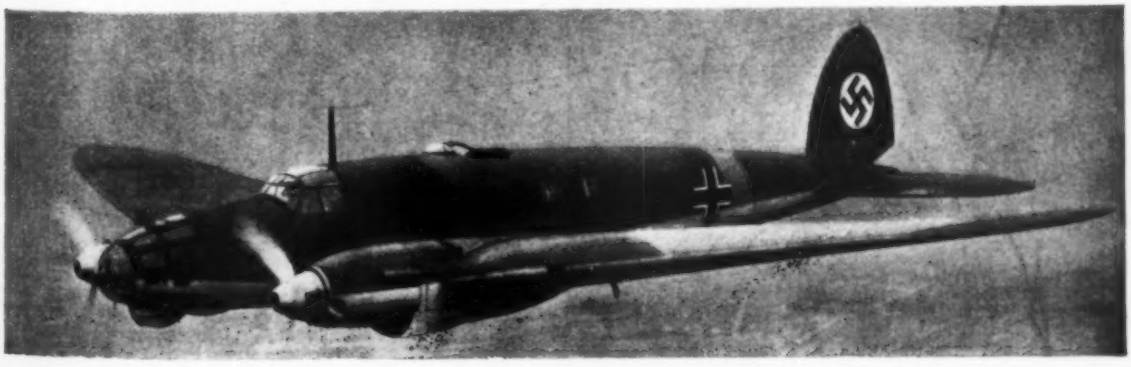


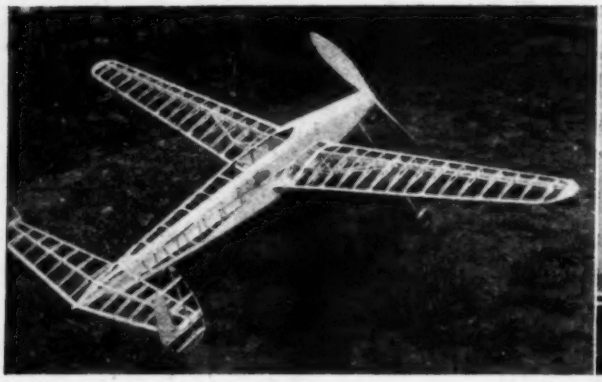


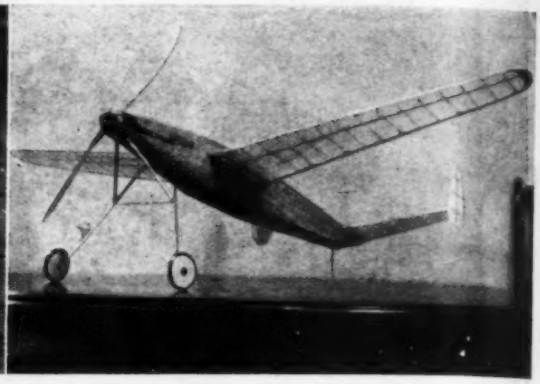
A German artist's impression: Mounting a Daimler-Benz DB 600 inverted vee in a He. 111. The original version of this machine had vee-twelve B.M.W.s.

(Above) A "shot" through the nose turret of a He. 111 bomber.

(Below) A close-up of one of the sleek He. 111s now in service in large numbers with the German Air Force. This machine must be one of the most formidable of its class in the world.







These two snapshots scarcely do justice to the fine workmanship in Mr. R. F. L. Gosling's mid-wing monoplane, described below.

MODELS

More First-class Construction : Show Exhibits : Competition Dates

by M. R. KNIGHT

A Wakefield Model from the North

ONE of the most consistent models built to the 1937 Wakefield formula is the mid-wing monoplane designed by Mr. R. F. L. Gosling, of the Bradford Model Flying Club. Though it did not win a place in the British Wakefield team, the steady take-off, flat glide, and average duration of 70 seconds showed it to be as capable of Cup-lifting as most, should it encounter its share of thermals. Distinguishing features are the constructional system of the fuselage, and the twin-ruddered tail-unit with "dihedralled" tail-plane.

The fuselage is flat-sided, but with well-rounded "corners." It is composed of twelve sections of built-up longeron, consisting of $\frac{1}{32}$in. balsa sheet rounded, and reinforced with $\frac{1}{16}$in. × $\frac{1}{16}$in. balsa. The parts are assembled with vertical and lateral cross-members of $\frac{1}{8}$in. × $\frac{1}{16}$in., the flat sides merging into a circular nose 2in. in diameter. Balsa sheet, $\frac{1}{32}$in. thick, is used for the covering as far as the trailing edge of the wings, and Jap tissue for the remainder.

Each outer wing-panel tapers in chord from 6in. to 3in., leading and trailing edges converging, and is given 8½ degrees of dihedral. Birch projections plug into a faired centre section, which fits in a groove in the fuselage sides two-thirds of the distance from the bottom, allowing ample variation in fore-and-aft positioning. Small pieces of adhesive hold panels and centre section in position. The span is 50½in., and the aerofoil section RAF 32, changing towards the tips to a symmetrical section and thereby giving a slight wash-out.

The main spar is a length of $\frac{1}{8}$in. × $\frac{3}{16}$in. above a length of $\frac{1}{8}$in. × $\frac{1}{8}$in., webbed with solid $\frac{1}{32}$in. sheet for a third of the span, and with holed sheet for a further third. For the leading-edge $\frac{1}{8}$in. × $\frac{1}{8}$in. is used, and for the trailing-edge $\frac{1}{8}$in. × $\frac{1}{16}$in., sanded to a knife-edge. The ribs are holed for lightness, and are 1½in. apart. Every third rib is of $\frac{1}{16}$in. sheet and is gusseted at the trailing edge; the others are of $\frac{1}{32}$in. sheet. The wing-tips are covered with $\frac{1}{32}$in. sheet, which also extends from the leading-edge almost to the main spar, on the upper surface.

Oval bamboo is used for the undercarriage struts, springing being by means of rubber bands working in short paper tubes.

The 60 sq. in. tailplane is 20in. in span, and tapers in chord from 4in. to 2in. The section is Clark Y, and the dihedral angle 8½ degrees, the same as the wings. A fin 6in. high, 3in. wide, and 15 sq. in. in area, is cemented to each end of the tailplane. The main spar of the tailplane tapers from $\frac{3}{8}$in. × $\frac{1}{8}$in. to $\frac{1}{8}$in. × $\frac{1}{8}$in., the leading-edge is $\frac{1}{8}$in. × $\frac{1}{8}$in., the trailing-edge $\frac{1}{8}$in. × $\frac{1}{16}$in., and the ribs $\frac{1}{32}$in. thick. The rudders are of $\frac{1}{16}$in. diameter bamboo, and their ribs $\frac{1}{16}$in. thick. An adjustable trimming-tab is fitted to each.

Two 40in. skeins of $\frac{5}{32}$in. American brown rubber, each of 12 strands, turn an airscrew of 16in. diameter and 20in. pitch. A free-wheel device is fitted.

The overall length of the model is 33in., and the weight 8¼oz., of which the rubber accounts for 2¾oz. Altogether, the machine is one of the most attractive and beautifully constructed which the writer has encountered. It has made flights considerably in excess of its Wakefield Trials average, and has proved very steady in bumpy weather.

GUN-FODDER. According to a Japanese correspondent, models of this type, built by the Tokyo Model Airplane Research Society, are to be used for short-range anti-aircraft practice. They are powered by 1/5th h.p. petrol engines. The machines are so nicely made that, as with our own Queen Bees, it seems a shame to shoot them down.

The Schoolboys' Exhibition

THE S.M.A.E. had a well-arranged stand at the Schoolboys' Exhibition, recently held at the Imperial Institute, South Kensington. Exhibits included two excellent shoulder-wing monoplanes with circular fuselages, tissue-covered, the work of Messrs. R. N. Bullock and E. Chasteneuf. The former secured second place for Great Britain in the 1937 Wakefield Contest, and the latter secured first place in the Wakefield Trials. Mr. S. R. Crow's record-holding Leopard Moth represented scale-modelling.

On another stand was shown the magnificent semi-scale Viper fighter, built by Mr. C. R. Moore, and described in *Flight* of March 4, 1937.

S.M.A.E. Competitions

THE following are the S.M.A.E. contests from June onwards:—

June 12.—Weston Cup, Wakefield models; decentralised.

June 19.—Ladies' Contest for cup presented by Mrs. Thurston, fuselage models flown by, but not necessarily constructed by, the entrant; decentralised, but London clubs will fly at Heath Row during "Northern Heights" Gala.

June 26.—Lady Shelley Cup, nearest flight to 45 sec. by a seaplane, Danson Park; also flying-boat contest for cup presented by Mr. H. E. White.

July 3.—Wakefield Trials, choosing of British Wakefield team, Fairey's Great West Aerodrome.

July 10.—*Model Engineer* Cup, aerodynamic efficiency on a formula, Fairey's.

July 17.—C.S.S.A. Cup, flying scale models, 1in. to 1ft., decentralised; also F.R.O.G. Cup trials for semi-scale models, decentralised, 6 best to compete in final at Wimbledon during T.M.A.C. Grand Rally, Sept. 11.

July 24.—11 a.m., Bowden Trophy, international, petrol models; 4 p.m., Sir John Shelley Cup, British petrol models; Fairey's.

July 31.—Wakefield International Contest, Guyancourt, near Paris.

(*Continued at foot of page 120.*)

HERE and THERE

Aerodynamics Lecture : F.A.I. Conference: Honour for Dr. Roxbee Cox : News of the Industry

To-night's R.Ae.S. Lecture

THIS evening (Thursday, February 3) Mr. E. F. Relf, A.R.C.Sc., F.R.Ae.S., F.R.S., will lecture before the R.Ae.S. on "Recent Research on the Improvement of the Aerodynamic Characteristics of Aircraft." In the course of his lecture Mr. Relf will give the results of recent research on profile drag in the compressed-air tunnel, drag of bodies, interference drag, and drag tests of complete models. He will also discuss stability and control, longitudinal stability, lateral stability in normal flight, lateral stability near the stall, and research on flutter.

The paper, which will be illustrated, will be delivered in the lecture hall of the Institution of Mechanical Engineers, Storey's Gate, London, S.W.1, at 6.30 p.m. Non-members are admitted by ticket obtainable through a member.

R.Ae.C. Official Notice

THE meeting of the General Council of the Fédération Aeronautique Internationale took place in Paris on January 24-27, and delegates from twenty-two countries attended. The Royal Aero Club was represented by the Marquess of Londonderry, Mr. Lindsay Everard, M.P., Capt. K. Bartlett, Dr. A. P. Thurston and Harold E. Perrin.

Among the subjects considered were the following: Standard maps for air touring, foreign Customs, and regulations for speed records and altitude records. Commissions dealing with gliding and model aircraft also conferred.

The next annual conference was fixed for Berlin in June next.

A.R.B.'s Technical Chief

THE Air Registration Board announce that they have appointed Dr. H. Roxbee Cox, Ph.D., D.I.C., B.Sc., F.R.Ae.S., to be their chief technical officer. He will begin his duties on March 1.

The appointment will be received with satisfaction by the aircraft industry, many members of which have come into contact with Dr. Roxbee Cox during his term of office in the Airworthiness Department at Farnborough. Those who have not will probably be surprised on meeting him for the first time to find not a learned scientist with long whiskers, but an alert and very much alive young man with original ideas on the subject of aircraft design.

At Brettenham House Dr. Roxbee Cox will, to some extent, carry on the work which he did with so much distinction at the R.A.E., but, obviously, its scope will be extended in some directions, although it will be confined to civil aircraft.

Harold Roxbee Cox has managed to cram into his 35 years of life an extensive and varied experience of aircraft work. He began in 1918 at the works of the Austin Motor Co., where he worked under Mr. John Kenworthy on the Austin Greyhound, Kestrel and Whippet. Afterwards he studied the theoretical side at the Imperial College of Science and did mathematical research under Professor Leonard Bairstow. In 1924 he went to the Royal Airship Works at Cardington, under Col. Richmond. In 1929 he was transferred to the R.A.E., where he specialised in structural investigations in the Airworthiness Department. This was followed by a short period at Cardington, and when airship development was abandoned, he returned to Farnborough as head of the branch which investigated flutter and other problems involving wing stiffness. Fairly recently Dr. Roxbee Cox was transferred to the newly formed armaments section.

H.M. THE KING during his inspection of the Electrical and Wireless School at Cranwell. A description of his visit appears on page 115.

Realism

NEWS of some tests carried out by the Bristol Company on the Pegasus Xc engine as fitted to the Short Empire boats suggests some entertaining possibilities.

In order to test the efficiency of the ignition system the engine was mounted on a test rig, fitted with an airscrew, and run at high speed. A large water spray was arranged immediately in front of, and slightly above, the hub, and the whole affair deluged with water at 120 gallons an hour. It is reported that the ignition system, which is of the fully screened type, stood up perfectly.

Now, here is an opportunity for Bristol and Elstree to co-operate! Next time the film world wants a hurricane "epic" they have only to borrow a Pegasus and its test crew.

Incidentally, recent detail improvements in the Xc valve gear, made as a result of long-period endurance tests, are stated to have lengthened the clearance adjustment period to over 150 hours.

Forthcoming Events

February 3. R.Ae.S. Lecture*: "Recent Research on Aerodynamic Characteristics," by Mr. E. F. Relf.

February 8. R.Ae.S. Isle of Wight Branch Lecture: "Tank Testing of Flying-boat Hulls," by Mr. L. P. Coombes.

February 9. York and Leeming Flying Club: Annual dance, Grand Hotel, Harrogate.

February 10. R.Ae.S. Portsmouth Branch Lecture: "Cowling and Cooling of Radial Engines," by Dr. G. P. Douglas.

February 11. D. H. Aeronautical Technical School: Annual Dance, Hyde Park Hotel, 9 p.m.

February 17. R.Ae.S. Coventry Branch Lecture: "Aircraft Motive Power," by Major E. F. Green.

February 17. Civil Aviation Service Corps: Annual Dance, First Avenue Restaurant, Holborn, London, W.C.1.

February 21-March 4. British Industries Fair.

February 25. Hampshire Aeroplane Club. Annual Dinner and Dance, South-Western Hotel, Southampton.

March 3. R.Ae.S. Lecture*: "Riveting Methods in Germany," by Dr.-Ing. W. Pleines.

March 4. Cambridge University Air Squadron: Annual Dinner, University Arms Hotel, Cambridge.

March 10. R.Ae.S. Portsmouth Branch Lecture: "Air Raid Precautions," by Sgt. Barnes.

March 24. R.Ae.S. Portsmouth Branch Lecture: "Refuelling in the Air," by Sir Alan Cobham.

April 7. R.Ae.S. Lecture*: "The Manipulation of the Boundary Layer," by Mr. E. G. Richardson.

April 21. R.Ae.S. Lecture: "High-altitude Flying," by Prof. J. E. Younger.

April 28. R.Ae.S. Lecture*: "Factors Controlling the Development of Electrical Ignition on Aero Engines" by Dr. G. E. Bairsto.

May 28-June 2. Belgrade Aero Show.

June 4-6. Manx Air Races.

June 4-7. Yorkshire Gliding Club: Whitsun Open Meeting, Sutton Bank.

July 17-August 1. Yorkshire Gliding Club: Open Contest, Sutton Bank.

August 7-21. Yorkshire Gliding Club: Instruction Course, Sutton Bank.

* All these lectures take place at the Institution of Mechanical Engineers, Storey's Gate, St. James's Park, London, S.W.1., beginning at 6.30 p.m.

Here and There (contd.)

A Westland Diversion

WESTLAND AIRCRAFT held their annual staff dance at Yeovil last Friday. Among those present were Capt. and Mrs. Peter Acland, A.V.-M. N. D. K. MacEwen, Mr. W. E. W. Petter, Mr. and Miss J. Fearn, and Mr. and Mrs. W. B. Hickman and Miss Hickman.

Mr. Alan P. Good, the new chairman of the company, was unable to attend as he was competing in the Monte Carlo Rally.

Fresh Air

EXPERTS in vehicle ventilation fittings, Airvac, Ltd., have recently moved from Darlington to larger and more modern works at Abbeydale Road, Wembley, Middlesex, with sales offices and showroom at 22, Newman Street, London, W.1.

An interesting ventilating device for aircraft is at present being developed. The directors of the company are Mr. B. Donald Hughes and Capt. E. L. Ford; the latter is bringing personal flying experience to bear on the problem.

D.H. Figures

DE HAVILLAND'S full accounts for the year ended September 30, issued last week, show a trading profit of £305,109, as compared with £192,875 for the corresponding period of 1936.

An allocation of £10,000 is to be made to start a staff benevolent fund, and after charging the dividend £18,130 will be carried forward, against £15,946. The 200,000 ordinary shares issued in July do not yet rank for dividend.

A payment of 12½ per cent. on the old ordinary shares, as against 10 per cent., was recently announced.

100,000 Eagle Eyes on Willesden

AT the annual dinner and dance of the Williamson Mfg. Co., Ltd., held recently at Hendon, Mr. Colin M. Williamson, C.B.E. (managing director), said that it would be indiscreet to mention any production figures for their Eagle aircraft cameras, but over 100,000 photographs had been taken from the works testing tower during the year; Willesden was on the way to rivalling Hollywood as the most-photographed place in the world!

Sir Philip Dawson, M.P., in the chair, said he was proud to be the head of an organisation which was outstanding not only because of the world-wide reputation of its products, but also on account of the spirit of co-operation which existed among its members from the office boy upwards.

Dunlop Jubilee Film

IN the film "Jubilee," which traces the evolution of the Dunlop pneumatic tyre from its invention in the village of Dreghorn, Ayrshire, in 1840, by John Boyd Dunlop, a veterinary surgeon, there are glimpses in more modern times of the Wright Brothers' first flight (1911) and, later, of the assembly of Dunlop aircraft brakes. There are also shots of a production Hawker Hurricane in action.

Although the major part of the film deals with Dunlop's many other activities at home and abroad, it is still of considerable interest to those concerned only with aircraft. Besides the historical details the treatment of the various stages of Latex rubber, from the tree seedling in Malaya to the finished tyre, is instructively shown.

"NATIONAL" APPOINTMENTS: Mr. Albert Hittinger (left), director and general manager of the National Benzole Co., Ltd., has been appointed managing director, while Mr. R. J. Smith (assistant general manager) becomes general manager.

Practical Oil Dispensing Equipment

IN addition to the aerodrome oil-servicing equipment recently reviewed in *Flight*, mention should be made of the dispensing apparatus supplied by Silvertown Lubricants, Ltd., West Silvertown, London, E.16, for use with their "Speedolene" aero oil.

This oil is available at aerodromes throughout the country in portable carriers for the accommodation of 20-25-gallon drums, and smaller "railway trolley-type" carriers are also supplied for use with ten-gallon drums. Both outfits have quart-measuring pumps, and the latest ten-gallon trolley has pneumatic tyres.

Aircraft Components Celebrate

SEVEN years ago Aircraft Components, Ltd., the well-known makers of undercarriage and hydraulic equipment, was formed by Mr. G. H. Dowty with a personnel of three.

A week or two ago, nearly 200 (as many as could get away from day and night work at Arle Court) attended the second annual dinner at Cheltenham.

Mr. R. H. Bound (technical director), in proposing "The Guests," expressed the firm's pleasure at having present Mr. D. L. Lipson, M.P. for Cheltenham, and a long list of distinguished visitors, all of whom had been closely associated with Aircraft Components during its romantic growth.

In his response Mr. Lipson said that this remarkable industry had been set up, without destroying any of the amenities of the town, in a manner that was an example to others and an indication that a town could have an industry in its midst and yet be able to preserve its natural beauties.

Mr. G. H. Dowty, responding to the toast of "The Firm," said: "It is less than seven years ago that I started this business in Cheltenham with two employees only, Mr. Dexter (now works manager) and Mr. Harriss (chief inspector). From our very modest beginnings we have grown rather rapidly and we are in the very pleasant position to-day of having an order book which will keep us busy for many years to come."

MODELS

(*Continued from page 118*)

Aug. 7.—Concours d'elegance, models capable of 30 sec. flight, to be judged for design, workmanship, etc., and best model from each club to compete in competition section of *Model Engineer* Exhibition in September; decentralised.
Aug. 14.—National Cup, inter-club, Fairey's.
Sept. 4.—Biplane contest, decentralised.
Sept. 18.—Farrow Shield, inter-club; decentralised.
Dec. 1.—Photographic contest (of models taken during season) closes. Decentralised contests are held simultaneously on the grounds of clubs affiliated to the S.M.A.E.

* * *

The Northern Heights Model Flying Club will hold their annual Gala at Fairey's Great West Aerodrome on June 12. Some very interesting contests are scheduled, of which more anon.

The Model Aircraft Club will hold their annual Grand Rally at Wimbledon Common on September 11.

* * *

The annual General Meeting of the Society of Model Aeronautical Engineers was held recently at the Royal Aeronautical Society, London, on January 12. A report will appear next month.

Following the publication of a photograph in last month's Models page of *Flight*, together with a description, considerable interest has been expressed in the beautiful tail-less mid-wing monoplane with monocoque fuselage, designed by Mr. W. P. H. Goodsir. I hear that International Model Aircraft, Ltd., of Merton, London, have decided to market a kit of materials for the construction of this model.

Mr. Goodsir is now designing a petrol-engined model of the Westland-Hill Mark V. Pterodactyl sesquiplane.

* * *

The Brighton District M.A.C. recently held a successful exhibition of model aircraft at the Robertson Hall. Exhibits included flying scale models, record-holding models and replicas, petrol engines and petrol planes.

* * *

Mr. Perry Snare, of Indiana, U.S.A., has constructed a successful petrol-engined model of the cross-channel Bleriot monoplane of 1909. The span is 5ft., the engine a 6 c.c. Baby Cyclone, and the best flight 3 min. 29 sec., finishing in a tree.